Road Impact Fee Study Update

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FELSBURG HOLT & ULLEVIG

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INTRODUCTION AND SUMMARY

El Paso County's road impact fee program was adopted in 2012 to create a more equitable method of establishing a fair-share contribution than the previous system of individually-negotiated developer exactions and small-area fees. The program identifies transportation improvements needed to accommodate growth, fairly allocates the costs of transportation improvements among affected developments, and ensures the proper and timely accounting of improvements and funds. The fee program includes options for developers to join a Public Improvement District that covers a portion of the fee obligation with district taxes, allowing for reduced up-front impact fee payment at time of building permit.

Fee Program Summary

Types of Improvements. The road impact fee program covers major corridors that accommodate regional travel. The program does not include all roads, only higher traffic and longer-distance roads (arterials and major rural collectors) within unincorporated El Paso County. Improvements currently included in the fee program have been identified in the current update of the *Major Transportation Corridors Plan* (MTCP). This transportation plan identifies improvements needed to accommodate anticipated growth in the unincorporated area by the year 2040 based on small-area growth forecasts. Only capacity-expanding improvements to County arterials, County rural collectors and selected State roads ("major roads") within the unincorporated area are included. The improvements that are eligible for funding with road impact fees are those identified in the Appendix, although this list may be modified between periodic MTCP/fee study updates with input from the stakeholder committee and approval by the Board of County Commissioners.

Standardized Unit Costs. The costs of improvements included in the fee program have been estimated based on standardized unit costs, developed in consultation with a stakeholder committee – the Oversight and Reimbursement Committee. The unit costs developed by the stakeholders are intended to be conservative and are not intended to fully cover all actual costs. The amount of developer credits or reimbursements for improvements identified in the MTCP will be based on the same unit costs. A 5% contingency has been added to address unexpected situations and cases in which the County will need to make improvements and pay higher actual costs. For this update, the unit costs developed in 2012 have been increased by 9.4% based on the recommendation of the stakeholder committee.

Non-Growth-Related Costs Excluded. The costs included in the fee calculations exclude any portions of project costs that are attributable to remedying existing deficiencies or accommodating future pass-through traffic.

Revenue Credits. The fees are reduced to account for future sales tax and gas tax revenue that new development will generate that will be used to remedy existing deficiencies and fund the planned improvements.

Developer Credits/Reimbursements. Colorado law requires that developers who construct improvements for which impact fees are charged receive a credit against their impact fees or be reimbursed. The road impact fee program provides the options of reduced fees and/or reimbursement to the developer in return for developer provision of eligible improvements.

Public Improvement Districts. In conjunction with the fee program, the County formed three Public Improvement Districts (PIDs) as an option to supplement the fee program. PID #1 is the controlling PID where all the money is transferred to and disbursed from. PID #2 collects a 10-mill property tax. PID #3 collects a 5-mill property tax. The two different mill levies are designed to give developers more choice of how to pay for the fee obligation. It allows developers to pick the mill levy and upfront fee that is best for their situation.

The PIDs issue bonds that are used to reimburse developers for a portion of their eligible improvement costs. Developers have the option of joining the PID at time of final plat. Developments within the PID are subject to a lower fee at building permit than developments that do not belong to the PID. If a development chooses to join the PID, then the property is subject to a mill levy of either 5 or 10 mills. Currently, there are 876 acres in PID #2 (10 mills) and 184 acres in PID #3 (5 mills).

For properties that join the PID, PID taxes cover a percentage of the impact fee costs. For example, for a single-family home in the 10-mill PID, the present value of future PID taxes equals roughly 81% of the fee obligation for a single-family home, so the fee paid at time of building permit is only about 19% of the full fee amount paid by a single-family home not in the PID. Current road impact fees for each of the PID options are shown in Table 1.

Table 1. Current Road Impact Fees

		Fee per Unit by PID Option		
Land Use	Unit	Not in PID	PID #3 (5 Mills)	PID #2 (10 Mills)
Single-Family	Dwelling	$3,218	$1,915	$609
Multi-Family	Dwelling	$2,010	$1,537	$1,061
Hotel/Motel	Room	$2,346	$1,639	$1,038
General Commercial	1,000 sf	$4,166	$3,059	$1,953
Convenience Comm.	1,000 sf	$7,355	$3,826	$304
Office	1,000 sf	$2,657	$997	$71
Public/Institutional	1,000 sf	$2,818	$1,091	$76
Industrial	1,000 sf	$3,050	$1,771	$492
Warehouse	1,000 sf	$1,559	$816	$72
Mini Warehouse	1,000 sf	$604	$122	$16

Source: El Paso County, "2015 Road Impact Fee Schedule," from County's web site.

The courts have generally held that PID bond authorizations only last for so long, perhaps 20 or 30 years. After that, the original authorization is held to be "stale," and a new election must be held. If there were only a single PID that new developments are continually joining, it would likely be difficult after 20-30 years to persuade voters within the PID to approve new bond authorizations. For this reason, the concept is to create multiple PIDs that sunset after the initial bond issues have been retired. It is estimated that a new PID would be created approximately every eight years.

Updated Fee Schedule

The updated fees for properties not located in a PID are compared to the current fees in Table 2. The updated fees are about 10% higher than current fees.

Table 2. Updated Road Impact Fee Comparison (Not in PID)

Land Use	Unit	Current Fee	Updated Fee	Percent Change
Single-Family	Dwelling	$3,218	$3,532	9.8%
Multi-Family	Dwelling	$2,010	$2,220	10.4%
Hotel/Motel	Room	$2,346	$2,587	10.3%
General Commercial	1,000 sf	$4,166	$4,572	9.7%
Convenience Comm.	1,000 sf	$7,355	$8,114	10.3%
Office	1,000 sf	$2,657	$2,933	10.4%
Public/Institutional	1,000 sf	$2,818	$3,109	10.3%
Industrial	1,000 sf	$3,050	$3,366	10.4%
Warehouse	1,000 sf	$1,559	$1,720	10.3%
Mini Warehouse	1,000 sf	$604	$669	10.8%

Source: Current fees for developments not in a PID from Table 1; updated fees from Table 16.

The total fee amounts due are the same for projects in a PID, but the upfront fee portion is less. The upfront fees for properties located in the 5-mill or 10-mill PID are based on average assessed values and the estimated portion of the fee for each land use type that will be generated by the PID taxes. Updated upfront fees for properties located in a PID are compared with current upfront fees in Table 3. In general,[1] the upfront fees are increasing by a larger percentage than the total fee amounts. This is because estimated values and the present value of future PID taxes are assumed to be unchanged, so the increase is all reflected in the upfront fee.

Table 3. Updated Upfront Road Impact Fee Comparison (In PID)

		5-Mill PID Upfront Fee			10-Mill PID Upfront Fee		
Land Use	Unit	Current	Updated	% Incr.	Current	Updated	% Incr.
Single-Family	Dwelling	$1,915	$2,229	16.4%	$609	$923	52%
Multi-Family	Dwelling	$1,537	$1,747	13.7%	$1,061	$1,271	20%
Hotel/Motel	Room	$1,639	$1,934	18.0%	$1,038	$1,279	23%
General Commercial	1,000 sf	$3,059	$3,465	13.3%	$1,953	$2,359	21%
Convenience Comm.	1,000 sf	$3,826	$4,585	19.8%	$304	$1,063	250%
Office	1,000 sf	$997	$1,273	27.7%	$71	$0	-100%
Public/Institutional	1,000 sf	$1,091	$1,382	26.7%	$76	$0	-100%
Industrial	1,000 sf	$1,771	$2,087	17.8%	$492	$808	64%
Warehouse	1,000 sf	$816	$977	19.7%	$72	$233	224%
Mini Warehouse	1,000 sf	$122	$187	53.3%	$16	$0	-100%

Source: Current fees from Table 1; updated fees from Table 17.

[1] For three land use categories in the 10-mill PID, the upfront fee is going to $0. This corrects an error that was made in the 2015 fee adjustment. These upfront fees were $0 in the 2012 resolution, but the present values of future PID taxes were higher than the total fee amounts for these land uses. The error in the 2015 adjustment was to assume that PID taxes exactly covered the total fee amount, and that any increase in the total fee should be reflected in the upfront fee for the 10-mill PID. No developments of this kind have occurred in the 10-mill PID since the fees were implemented.

LEGAL FRAMEWORK

Impact fees are a way for local governments to require new developments to pay a proportionate share of the infrastructure costs they impose on the community. In contrast to "negotiated" developer exactions, impact fees are charges assessed on new development using a standard formula based on objective characteristics, such as the number and type of dwelling units constructed. The fees are a one-time, up-front charge, with the payment made at the time of building permit issuance. Impact fees require that each new development project pay a pro-rata share of the cost of new capital facilities required to serve that development.

Since impact fees were pioneered in states that lacked specific enabling legislation, such fees have generally been legally defended as an exercise of local government's broad "police power" to regulate land development in order to protect the health, safety and welfare of the community. The courts have developed guidelines for constitutionally-valid impact fees, based on the "dual rational nexus" standard. The standard essentially requires that fees must be proportional to the need for additional infrastructure created by the new development, and the fees must be spent to provide that same type of infrastructure to benefit the new development.

State Statutes

Prior to 2001, the authority of counties in Colorado to impose impact fees was not entirely clear. Several counties had adopted impact fees, which they felt were authorized under counties' implied powers. This uncertainty was removed with the passage of SB 15 by the Legislature and its signature by the governor on November 16, 2001. Among other things, this bill created a new Section 104.5: Impact Fees, in Article 20 of Title 29, Colorado Revised Statutes, which specifically provides that:

> *Pursuant to the authority granted in section 29-20-104 (1) (g) and as a condition of issuance of a development permit, a local government may impose an impact fee or other similar development charge to fund expenditures by such local government on capital facilities needed to serve new development.*

Section 29-20-104.5(1) requires that impact fees be based on a schedule of fees that is legislatively adopted, applies to development generally, as opposed to an individual development project, and only covers the cost of capital improvements needed to serve new development:

> *No impact fee or other similar development charge shall be imposed except pursuant to a schedule that is:*
>
> *(a) legislatively adopted;*
> *(b) generally applicable to a broad class of property; and*
> *(c) intended to defray the project impacts on capital facilities caused by proposed development.*

Section 29-20-104.5(2) requires the preparation of a report that quantifies the cost attributable to new development and ensures that new development is not charged for the cost to remedy existing deficiencies:

> *A local government shall quantify the reasonable impacts of proposed development on existing capital facilities and establish the impact fee or development charge at a level no greater than necessary to defray such impacts directly related to proposed development. No impact fee or other similar development charge shall be imposed to remedy any deficiency in capital facilities that exists without regard to the proposed development.*

Section 29-20-104.5(3) provides that credit against impact fees must be given for required developer contributions of land or improvements for the same facilities for which the impact fees are charged:

> *Any schedule of impact fees or other similar development charges adopted by a local government pursuant to this section shall include provisions to ensure that no individual landowner is required to provide any site specific dedication or improvement to meet the same need for capital facilities for which the impact fee or other similar development charge is imposed.*

Impact fees may be imposed for a broad range of facilities. Section 29-20-104.5(4) provides that impact fees can be imposed to "defray the projected impacts on capital facilities caused by proposed development." It defines "capital facility" to mean any improvement or facility that:

> *(a) is directly related to any service that a local government is authorized to provide;*
> *(b) has an estimated useful life of five years or longer; and*
> *(c) is required by the charter or general policy of a local government pursuant to a resolution or ordinance.*

Section 29-20-104.5(5) requires that impact fees collected must be earmarked and spent for the same types of improvements for which they were collected, and also authorizes waivers for affordable housing:

> *Any impact fee or other similar development charge shall be collected and accounted for in accordance with part 8 of Article 1 of this title. Notwithstanding the provisions of this section, a local government may waive an impact fee or other similar development charge on the development of low- or moderate-income housing or affordable employee housing as defined by the local government.*

The statutory provision referenced above (Section 29-1-803) requires separate accounting for each type of fee, and requires that interest earned on each account be retained in that account:

> *Except as otherwise provided in this section, all moneys from land development charges collected, including any such moneys collected but not expended prior to January 1, 1991, shall be deposited or, if collected for another local government, transmitted for deposit, in an interest-bearing account which clearly identifies the category, account, or fund of capital expenditure for which such charge was imposed. Each such category, account, or fund shall be accounted for separately. The determination as to whether the accounting requirement shall be by category, account, or fund and by aggregate or individual land development shall be within the discretion of the local government. Any interest or other income earned on moneys deposited in said interest-bearing account shall be credited to the account.*

Constitutional Requirements

While State law 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 new development (the "needs test"); and

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

The "needs test" requires that 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. This requirement is echoed in the requirements in the Colorado act that impact fees be "intended to defray the projected impacts on capital facilities caused by proposed development" and "be generally applicable to a broad class of property."

The "benefit test" requires that impact fees be spent to provide benefit to new development. Benefit is ensured by providing that the funds be earmarked for capacity-expanding improvements of the type for which the fees are collected. The Colorado act requires this type of earmarking. Additional methods of ensuring benefit are to require that the fees be refunded if they have not been used within a reasonable period of time, or to earmark the funds collected within a geographic subarea be spent within the same geographic subarea.

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. This principle, which is a critical part of the "needs test," is reflected in the Colorado impact fee statute's prohibition against using impact fee funds to remedy existing deficiencies (Section 29-20-104.5(2)). In addition, 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.

A corollary principle is that new development should not have to pay twice for the same level of service. As noted above, 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 addition, new development should receive reimbursement or credit against the fees for developer contributions of right-of-way, actual construction, or monetary payments related to the completion of the improvements on which the impact fees are based. The fees should also be reduced to account for future dedicated revenues, such as sales taxes or motor fuel taxes, that will be used to fund a portion of the cost of the improvements. However, credit is not required for discretionary County funding that may be used to help pay 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.

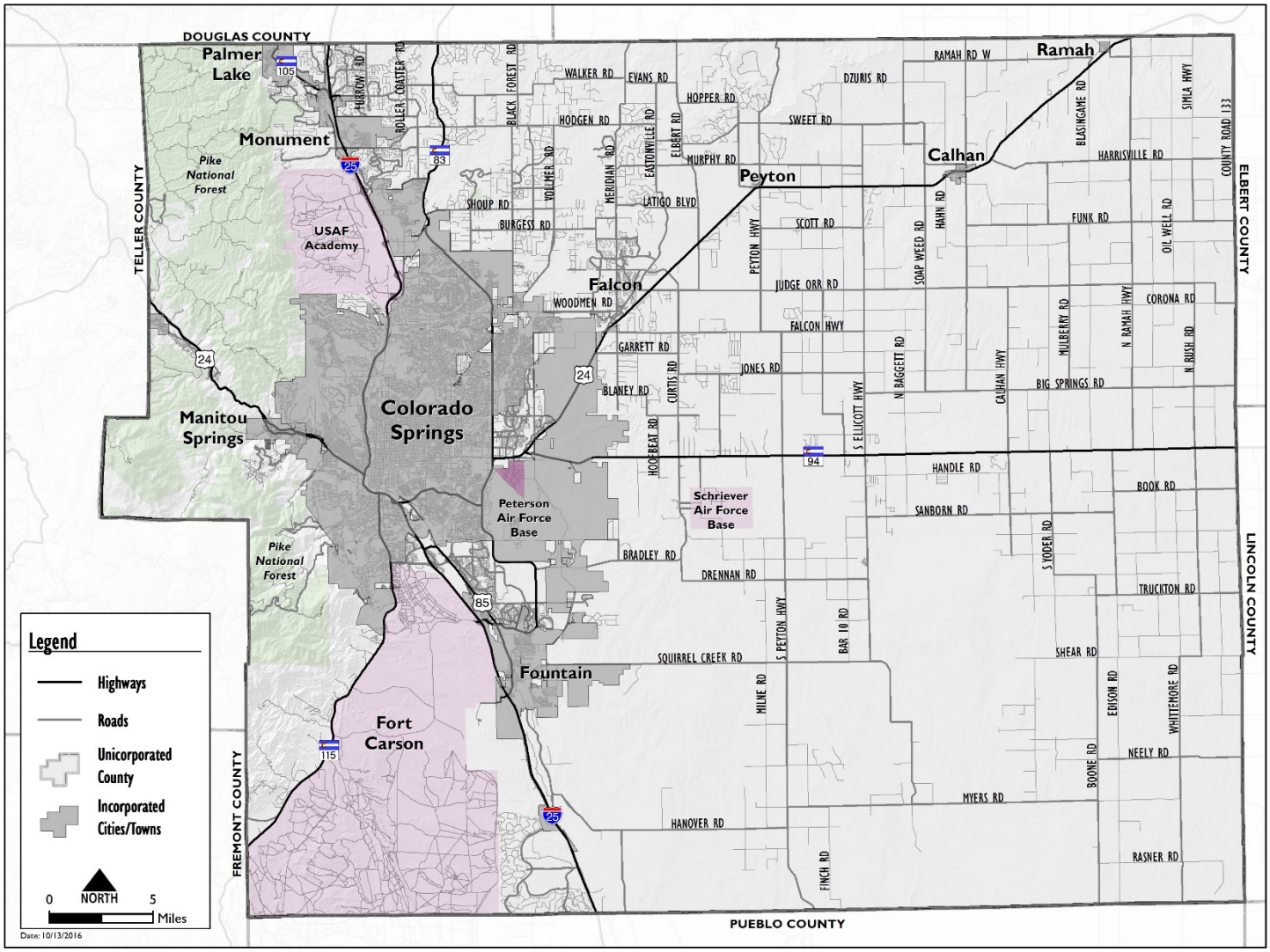
ASSESSMENT AND BENEFIT DISTRICTS

In an impact fee system, it is important to clearly define the geographic areas within which impact fees will be collected and spent. There are two types of geographic areas that serve different functions in an impact fee system: assessment districts and benefit districts. An assessment district is a geographic area that is subject to a uniform fee schedule. Benefit districts, on the other hand, represent areas within which the collected fees must be spent. Benefit districts ensure that improvements funded by impact fees are constructed within reasonable proximity of the fee-paying developments.

Assessment Districts

The County's road impact fee is charged to new development in the unincorporated areas of the county. The County currently uses a single fee schedule that applies uniformly throughout the unincorporated area, which is illustrated in Figure 1.

Figure 1. El Paso County Map



Benefit Districts

The fee revenues can be spent anywhere in the unincorporated area. While the County had initially considered dividing the unincorporated area into several benefit districts, the County has opted for a single benefit district encompassing the entire unincorporated area. There were several reasons for this decision.

First, the fee program is focused primarily on arterial roadways, which account for 84% of net program improvement costs. The function of arterials is to move traffic long distances. The arterial road system forms an integrated network, and any attempt to draw lines to divide it into subareas would inevitably be somewhat artificial. Larimer County, for example, which is somewhat larger than El Paso County, has a single county-wide benefit district for regional roads, which are comparable to the types of roads covered by El Paso County's fee program.

Second, the creation of multiple benefit districts would increase the complexity of the system. For example, it would likely necessitate establishing a separate Public Improvement District

(PID) for each benefit district. It would also increase the administrative burden of tracking and accounting fee collections and expenditures.

Third, a county-wide benefit district would essentially be self-regulating in terms of matching the geographic location of need and benefit. Because the fee program primarily functions to reimburse those who make needed improvements, the expenditures will tend to go to the areas were development is occurring.

Fourth, multiple benefit districts would unnecessarily restrict the use of impact fee funds, making it more difficult to accumulate sufficient funds to make improvements or provide reimbursements.

METHODOLOGY

This section describes the methodology used to develop and update El Paso County's road impact fees.

Plan-Based Approach

The road impact fees are calculated using a "plan-based" methodology. The plan-based approach uses a travel demand model to forecast future traffic volumes, which are then compared to existing roadway capacities to identify needed improvements. The portion of the total cost of those improvements that is attributable to growth (after deductions for adjacent developer responsibility, through trips and existing deficiencies) is divided by the number of new trips over the planning period to determine a cost per trip.

Improvements included in the fee program have been identified in the most recently adopted Major Transportation Corridors Plan (MTCP). This transportation plan identifies improvements needed to accommodate anticipated growth in the unincorporated area over the 2016-2040 period based on small-area growth forecasts.

Types of Improvements

This program covers major corridors that provide regional travel. The program does not include all roads, only County arterials and major rural collectors, as well as a few selected State roads ("major roads") within unincorporated El Paso County. Only capacity-expanding improvements to major roads identified in the MTCP are included. Types of eligible improvements include construction of new roads, widening existing roads, paving gravel roads, intersection improvements and signalization, as well as acquisition of additional rights-of-way (ROW) required for such improvements. Intersection improvements and signalization improvements included in the program are limited to the intersection of two major roads. The specific improvements that can be funded by the fee program, or for which credits or reimbursements may be provided, are identified in Table 20 and Table 21 in the Appendix. The list of eligible projects, costs and fee amounts will be updated over time with input from the stakeholder committee and approval by the Board of County Commissioners.

Standardized Unit Costs

The fee program uses a standardized unit cost approach. The same costs used to calculate the fees are also used to determine the amount of credit or reimbursement due for eligible improvements. In order for an eligible road to qualify for a credit or a reimbursement, all aspects of the road must be constructed to County standards and be accepted by the County. The standardized unit costs are summarized in Table 4 below.

The construction costs for segment and intersection improvements are estimated using standard costs per linear foot of segment or per intersection leg, based on unit costs for a limited number of components, including asphalt, curb & gutter/shoulders, earthwork and construction management. The component unit costs developed by the stakeholders are intended to be conservative and are not intended to fully cover all actual costs. Certain cost components, such as utility relocation, were purposely omitted because they are extremely variable. Intersection costs are calculated as the

additional cost beyond the cost of the standard road segment. Intersection costs include both additional construction and additional right-of-way.

Right-of-way (ROW) costs are estimated based on the number of acres required and a standard, county-wide cost per acre. While construction and ROW costs are lumped together in the segment and intersection unit costs shown below, developers will receive credit separately for linear feet constructed and ROW dedicated. Signal costs (for State road intersections only) are estimated and credited based on the number of needed signals and a standard cost per signal based on the Colorado Department of Transportation's (CDOT) escrow requirement.

Table 4. Summary of Standardized Unit Costs

Improvement Type	Unit	Unit Cost
Segment Improvements:		
Rural Road Paving	Linear Foot	$62.16
Rural Road Upgrade	Linear Foot	$188.30
Rural Minor Collector	Linear Foot	$173.34
Rural Minor Arterial	Linear Foot	$230.49
Urban Nonresidential Collector	Linear Foot	$247.56
Urban Minor Arterial	Linear Foot	$341.82
Urban Principal Arterial (4 lane)	Linear Foot	$495.84
Urban Principal Arterial (6 lane)	Linear Foot	$674.34
Urban Expressway (4 lane)	Linear Foot	$538.85
Urban Expressway (6 lane)	Linear Foot	$674.34
Rural Principal Arterial (4 lane)	Linear Foot	$484.02
Rural Principal Arterial (6 lane)	Linear Foot	$746.66
Rural Expressway (4 lane)	Linear Foot	$504.46
Rural Expressway (6 lane)	Linear Foot	$688.94
State Road, Type A (4 lane divided)	Linear Foot	$437.67
State Road, Type AA (6 lane divided)	Linear Foot	$700.23
Intersection Improvements:		
Urban Minor Arterial (4 lane)	Intersection Leg	$15,032
Urban Principal Arterial (4 lane)	Intersection Leg	$76,355
Urban Principal Arterial (6 lane)	Intersection Leg	$121,030
Traffic Signal on State Road	Each	$350,000

Note: Costs shown include ROW costs

Source: Segment improvement cost per linear foot from Table 18 in Appendix; intersection costs per leg from Table 19 in Appendix; unit costs for rural road paving and upgrades from Duncan Associates/LSA Associates, Major Transportation Corridors Plan: Road Impact Fee Study, November 2012, Table 2, increased by a cost inflation factor of 9.4%, as recommended by the Oversizing and Reimbursement Committee, June 7, 2016; signal cost is CDOT signal escrow requirement.

Excluded Costs

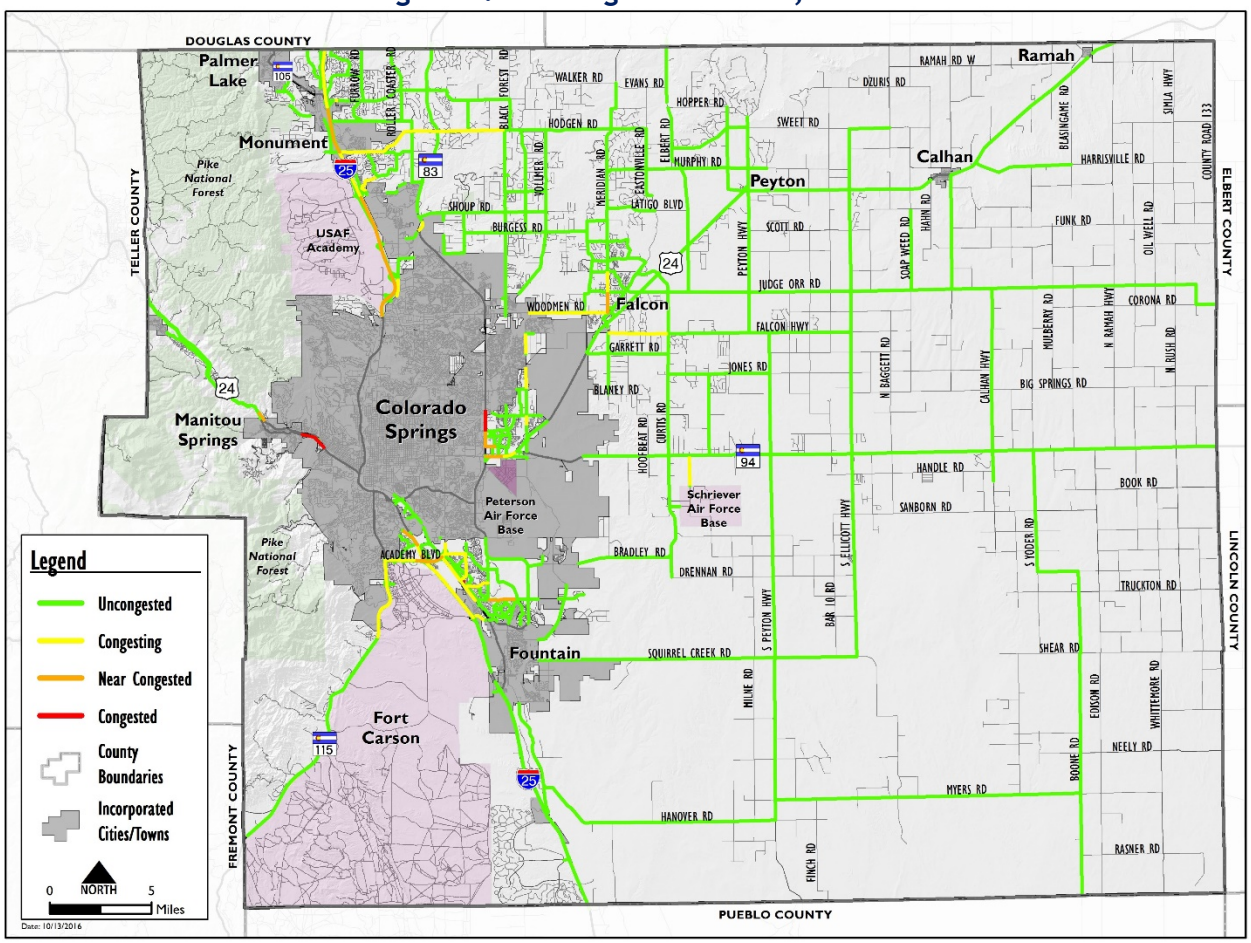
The costs included in the fee calculations are less than the total costs of the needed improvements. As noted above, only certain cost components will be included in the fee calculations, and those costs will be based be based on standardized costs that will likely understate the actual costs of improvements. In addition, any portions of project costs that are attributable to remedying existing deficiencies, or accommodating future pass-through traffic that is unrelated to development in the unincorporated area, are excluded from the fee calculations.

Travel Demand Model

One of the key technical tools in preparing the *2040 Major Transportation Corridors Plan* (MTCP) on which the updated fees are based is the travel demand forecasting model. The model predicts future travel patterns and volumes based on travel demand (i.e., trip-making) generated by socioeconomic data on the number of households and employees for small areas. The resulting travel is assigned to the roadway network to project future traffic volumes on each roadway segment. These growth scenarios are based on the official Small Area Forecasts developed by the Pikes Peak Area Council of Governments (PPACG) in 2013 for the *2040 Moving Forward Plan*, the regional transportation plan approved in 2015. These base forecasts, which were recently completed and involved an extensive input process from regional planning entities, were adjusted and refined through additional data gathering and review for the MTCP, while still maintaining base year (2010) and 2040 control totals at the regional level.

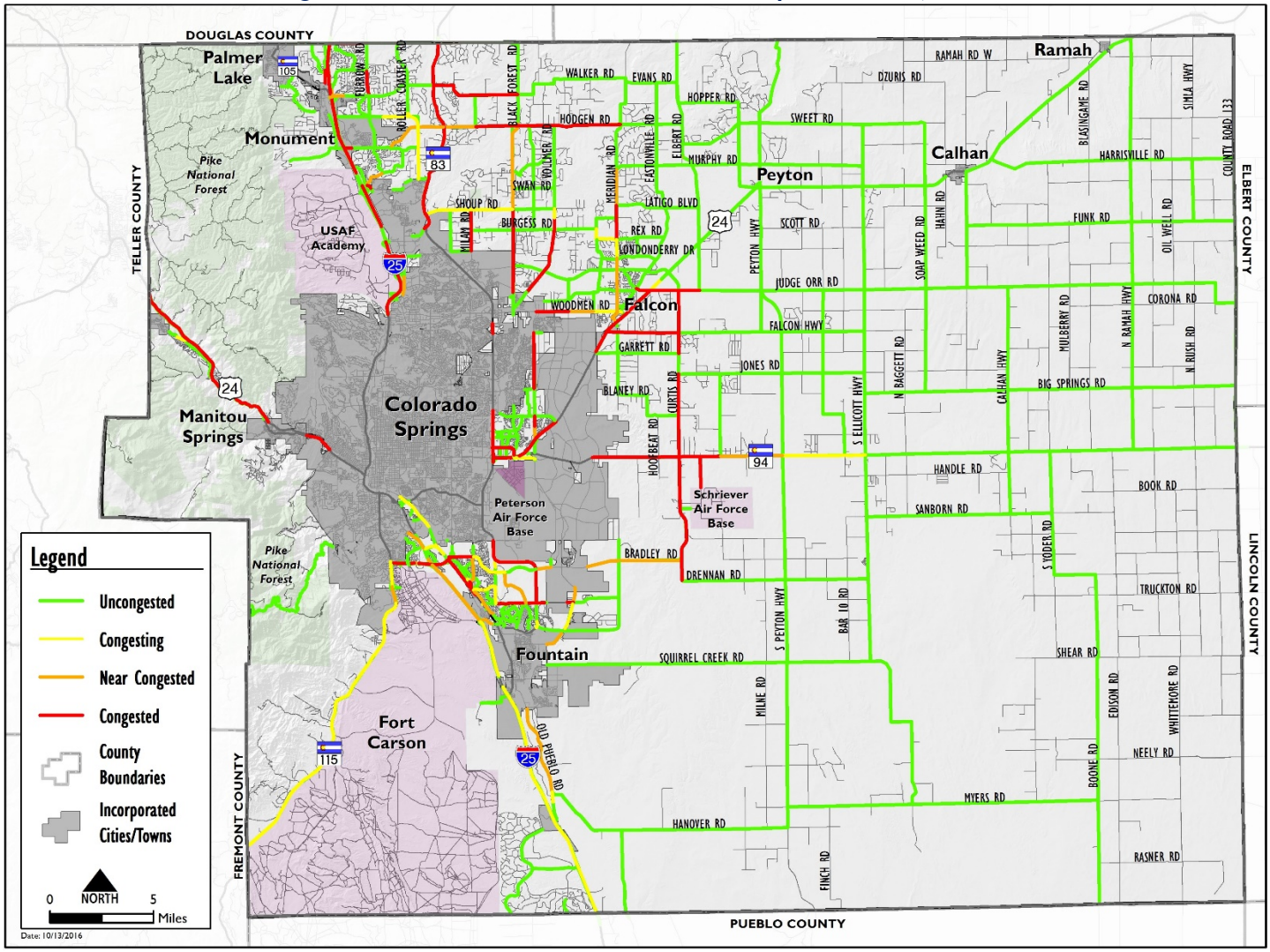
Using the model, analysis was performed to determine where future traffic volumes will exceed available roadway capacity, and several alternative transportation improvements were tested to evaluate the benefits of adding roadway capacity. Modeling of the existing major road network, including improvements that have committed funding but are not yet completed, reveals the existence of some existing capacity deficiencies. These are shown as "congested" in Figure 2.

Figure 2. Existing Deficiencies, 2016



Modeling of future 2040 volumes based on the socioeconomic forecasts and the existing and committed network reveals a substantial increase in congestion in the absence of additional road improvements. The future levels of service are illustrated in Figure 3.

Figure 3. Future Deficiencies without Improvements, 2040



COST PER TRIP

Using a planned-based methodology as described in the previous section, the portion of the total cost of planned improvements needed over the planning horizon (2016-2040) that is attributable to growth within the unincorporated county is divided by the total trip ends that will be generated by new development in the unincorporated county to determine the cost per trip. The costs used in the fee calculations are not estimated actual costs, but rather standardized unit costs for various types of improvements that exclude some components

The costs that are attributable to new development in the unincorporated area exclude (1) costs attributed to existing deficiencies, and (2) costs attributable to pass-through traffic. Existing deficiency costs were identified for projects where existing traffic volumes exceed existing roadway capacities. The deficiency is determined to be a percentage of the project cost, based on the following formula: (2016 volume – 2016 capacity) ÷ (2040 volume – 2016 capacity). In addition, some costs are attributable to growth in trips that is unrelated to new development in the unincorporated area. Modeling was performed to determine the number of existing and future trips that are "pass-through" - that is, they do not have an origin or destination in the unincorporated area. The percentage of project costs attributable to pass-through traffic was based on model analysis of 2040 conditions.

Planned Improvement Costs

Based on the modeling described in the previous section, as well as public and stakeholder input, a set of roadway improvement projects was identified as necessary to accommodate anticipated growth over the 2016-2040 planning horizon. The locations of the improvements are illustrated in Figure 4 below.

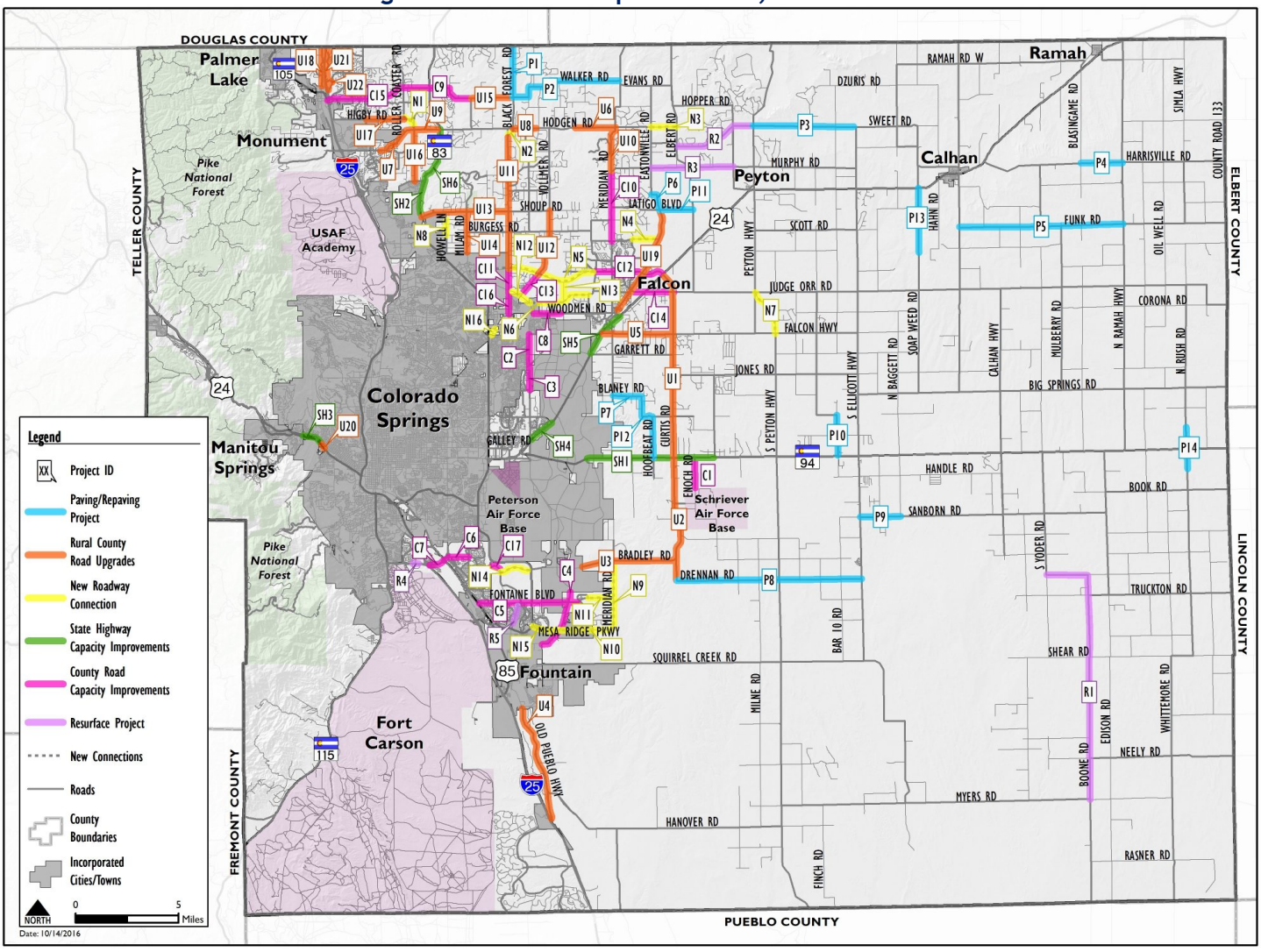
Improvement project costs include roadway segment improvements, intersection improvements associated with those segments, and signals that will need to be installed at intersections of State roads associated with those improvements. The costs of the planned improvements are summarized in Table 5, based on detailed information for each improvement and standardized unit costs included in the Appendix. Intersection and signal costs are included, and non-growth-related costs attributable to existing deficiencies and pass-through traffic are excluded. Total net improvement costs also include outstanding credit reimbursements for improvements constructed prior to the ordinance that will be reimbursed through the fee program, as well as the cost of transportation plan and fee study updates that will need to be done over the next 24 years to keep the program abreast of changing conditions.

Table 5. Summary of Planned Improvement Costs, 2016-2040

Improvement Type	Miles	Segment Cost	Intersect./ Signals	Less Deficiencies	Less Through Trips	Net Program Costs
County Arterials	37.39	$102,416,675	$2,404,442	-$1,055,985	-$10,417,757	$93,347,375
New County Road Connections	24.58	$50,858,865	$943,934	$0	-$2,266,866	$49,535,933
County Rural Road Upgrades	71.61	$71,199,012	$1,273,443	$0	-$3,884,850	$68,587,605
County Rural Road Paving	49.82	$16,349,850	$0	-$921,505	-$1,904,760	$13,523,585
Subtotal, County Road Projects	183.39	$240,824,402	$4,621,819	-$1,977,490	-$18,474,233	$224,994,498
State Road Projects	15.08	$42,147,756	$3,934,230	-$614,121	-$6,264,824	$39,203,041
Total Planned Improvements	198.47	$282,972,158	$8,556,049	-$2,591,611	-$24,739,057	$264,197,539
Outstanding Pre-Ordinance Reimbursements						$8,693,554
Cost of Transportation Plan and Fee Study Updates Every 5 Years						$1,920,000
Total Improvement Costs						$274,811,093

Source: Miles from Table 20 in Appendix; costs, deficiencies and through trip reductions from Table 22; outstanding reimbursement credits from Table 24; plan/study update costs based on 4.8 (24 years ÷ 5 years between updates) at $400,000 each.

Figure 4. Planned Improvements, 2016-2040



New Trips

In a plan-based impact fee methodology, the total cost of planned improvements attributed to growth over the planning horizon is divided by new trips anticipated to occur over the same period. Since costs attributed to pass-through traffic have been excluded from the program costs, only new trips generated by development in the unincorporated area are considered. Each trip has two trip ends – an origin and a destination. While this report sometimes uses the term "trips," generally what is meant by that is trip ends. The trip generation data provided by the Institute for Transportation Engineers *Trip Generation Manual* are trip ends. Trips with both an origin and destination in the unincorporated area have two trip ends in the unincorporated area, while other types of trips related to development in the unincorporated area only have one trip end in the unincorporated area.

Ideally, the fee calculations would divide needed improvements over the 2016-2040 period by new trips over the same 24-year period. However, estimating total trips attributable to development in the entire unincorporated area requires reliance on the travel demand model, and the base year for the model is 2010. Consequently, the fee calculations will divide the cost of improvements needed over 24 years by the new trips generated over 30 years, resulting in somewhat lower fees than would be the case if the model base year was more current.

The new trip ends that will be generated by development in the unincorporated area over the 2010-2040 period total 824,255, as shown in Table 6. However, some of those trips will be generated by development in the Woodmen Road, Central Marksheffel, Constitution and Lorson Ranch developments, which have been deemed to have satisfied their fee obligations. Deducting future trip ends from these developments results in 709,868 net new trip ends.

Table 6. Growth in Unincorporated Area Trips, 2010-2040

		Trip Ends/	2010		2040		Growth	
From	To	Trip	Trips	Trip Ends	Trips	Trip Ends	Trips	Trip Ends
Unincorp	Unincorp	2	185,223	370,446	420,898	841,796	235,675	471,350
Unincorp	Incorp	1	186,858	186,858	351,469	351,469	164,611	164,611
Unincorp	Teller	1	2,760	2,760	5,732	5,732	2,972	2,972
Unincorp	External	1	5,873	5,873	14,712	14,712	8,839	8,839
Incorp	Unincorp	1	186,901	186,901	351,575	351,575	164,674	164,674
Teller	Unincorp	1	2,759	2,759	5,729	5,729	2,970	2,970
External	Unincorp	1	5,873	5,873	14,712	14,712	8,839	8,839
Total Unincorporated Area			576,247	761,470	1,164,827	1,585,725	588,580	824,255
– New Trip Ends from Developments with Satisfied Fee Obligations								-114,387
Net New Trip Ends, 2010-2040								709,868

Source: Felsburg Holt & Ullevig, data from Major Transportation Corridors Plan analysis, October 4, 2016.

Cost per Trip

Dividing total growth-related costs by the growth in trip ends from new development in the unincorporated area yields a cost of $387.13 per trip end, as shown in Table 7. In addition, the steering committee agreed during the 2012 study that a 5% contingency should be added to program costs to address unexpected situations as well as the difference between fee program unit costs and actual costs that will be incurred by the County in constructing improvements where no developer is available to make a needed improvement. With the addition of those contingency costs, the total cost is $406.49 per trip end.

Table 7. Cost per Trip

Total Growth-Related Costs, 2016-2040	$274,811,093
÷ Total New Trip Ends, 2010-2040	709,868
Cost per Trip End	$387.13
Plus 5% Contingency for Actual County Costs	$19.36
Total Cost per Trip End	$406.49

Source: Total costs from Table 5; new trip ends from Table 6; contingencies added based on 2012 recommendation of steering committee.

REVENUE CREDITS

As discussed in the legal framework section, credit against the road impact fees should be provided for future revenue that will be generated by new development and used to help pay for outstanding debt on existing facilities or to remedy existing capacity deficiencies. In addition, credit can be provided for future dedicated funding or anticipated outside funding that can be used to fund roadway capacity improvements. These are referred to as "revenue credits," and are the focus of this section. Credits or reimbursements should also be provided to those who construct eligible improvements that are included in the list of planned improvements on which the fees are based. These are referred to as "developer credits," and are calculated on a case-by-case basis.

El Paso County has not historically used bonding to pay for roadway improvements, and does not have any outstanding debt from past roadway improvements. Some outside funding is anticipated to be available to help fund some of the improvements identified in this report, and a credit for such funding is provided in this section.

It should be noted that costs attributable to remedying existing capacity deficiencies have been excluded from the fee calculations. However, a credit for deficiencies is still warranted, because new development will help fund the deficiency correction. A relatively simple approach to calculating an appropriate credit is to divide the total cost of existing deficiencies by the number of existing trips to determine a credit per trip. This puts new development on equal footing with existing development. Dividing the total cost to remedy existing deficiencies by total existing trip ends in El Paso County yields a deficiency credit of $3.40 per trip end.

Table 8. Deficiency Credit per Trip

Corridor	From	To	Program Cost	% Defic.	Deficiency Cost
Academy Blvd	I-25	Bradley Rd	$2,823,489	37.4%	$1,055,985
Black Forest Rd	Walker Rd	County Line Rd	$804,430	100.0%	$804,430
Harrisville Rd	Blasingame Rd	Ramah Hwy	$659,035	11.1%	$73,153
Blaney Rd S	Meridan Rd	Hoofbeat Rd	$463,097	0.8%	$3,705
Log Rd	90 degree bend	SH 94	$638,358	6.3%	$40,217
US 24	31st St	Manitou Interchg	$2,456,484	25.0%	$614,121
Total Deficiency Cost					$2,591,611
÷ Existing Unincorporated Area Trip Ends					761,470
Deficiency Credit per Trip End					$3.40

Source: Program costs and deficiency percentages from Table 21 and Table 22 in the Appendix; existing unincorporated area trip ends (for 2010 base year) from Table 6.

As noted above, credit should also be provided for anticipated outside funding. Some funding from the county-wide Pikes Peak Rural Transportation Authority sales tax and from State and Federal highway funds is anticipated to be programmed for some of the major road capacity improvements identified in this study. Fee program projects included in the "A" list in the fiscally-constrained project list of the Pikes Peak Area Council of Governments (PPACG)'s 2040 Regional Transportation Plan are identified in Table 9 below, along with one typical "B" list project. In recent years no projects from the "B" list have received funding, but some funding was assumed to be conservative. The

credit is calculated as the net present value of revenue generated per unincorporated area trip end over the next 25 years (the period covered by the regional plan).

Table 9. Outside Funding Credit

Road Name	From	To	Category	Fee Program Net Cost
Hwy 105	Knollwood Rd	US 83	County Arterial	$12,778,258
Monument Hill	Woodmoor	County Line Road	Rural Road Upgrade	$566,575
Deer Creek	Monument Hill	Woodmoor	Rural Road Upgrade	$96,996
Eastonville	McLaughlin	Latigo	Rural Road Upgrade	$5,556,198
Beacon Lite	Hwy 105	County Line Road	Rural Road Upgrade	$1,779,247
Mesa Ridge	Powers	Marksheffel	New County Connection	$2,146,004
Acadmemy	I 15	Bradley Rd	County Arterial	$1,146,336
US 24	Garrett Rd	Woodmen	State Road	$8,912,033
Intersection Projects Overlapping with Fee Program				$1,512,488
PPRTA "B" List Average Project				$6,720,000
Total Fee Program Net Cost with PPRTA/CDOT Funding				$41,214,135
÷ Years Covered by 2040 Regional Transportation Plan				25
Annual PPRTA/CDOT Funding for Fee Program Projects				$1,648,565
÷ Existing Unincorporated Area Trip Ends				761,470
Annual PPRTA/CDOT Funding for Fee Program Projects per Trip End				$2.16
x Present Value Factor (25 Years)				16.48
Outside Funding Credit per Trip End				$35.60

* the fee program cost has been multiplied by a factor of 2.2 miles/3.358 miles, which is the portion of the fee program project that is addressed by the PPRTA project

Source: Fee program net costs from Table 22 in the Appendix for planned projects that have anticipated outside funding in the PPACG 2040 Regional Transportation Plan fiscally-constrained project list; existing unincorporated area trip ends from Table 6; net present value factor based on discount rate of 3.5%, the average bank prime loan interest rate in September 2016 from the Federal Reserve.

Subtracting the deficiency and outside funding credits from the cost results in a net cost of $367.49 per trip end, as shown in Table 10.

Table 10. Net Cost per Trip

Cost per Trip End	$406.49
– Deficiency Credit per Trip End	-$3.40
– Outside Funding Credit per Trip End	-$35.60
Net Cost per Trip End	$367.49

Source: Cost per trip end from Table 7; deficiency credit from Table 8; outside funding credit from Table 9.

TRAVEL DEMAND

To determine road impact fees for individual land use categories, the travel demand associated with a unit of development (dwelling unit, 1,000 square feet of nonresidential development, etc.) must be determined. For this study, travel demand is expressed in terms of daily trip ends, adjusted to account for pass-by and diverted-linked trips, as well as average trip length by trip purpose. Trip characteristics are drawn from national data, and calibrated to ensure that they reflect local travel demand.

Trip Characteristics

The travel demand generated by specific land use types in El Paso County is a product of four factors: 1) trip generation, 2) percent new trips, 3) average trip length and 4) a local adjustment factor to calibrate national travel characteristics to reflect local travel demand.

Trip Generation

Trip generation rates are 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 at the site of a land use. Thus, a single one-way trip from home to work counts as one trip end for the residence and one trip end for the work place, for a total of two trip ends.

New Trip Factor

Trip rates must be adjusted by a "new trip factor" to exclude pass-by and diverted-linked trips. This adjustment is intended to reduce the possibility of over-counting by only including primary trips generated by the development. Pass-by trips are those trips that are already on a route for a different primary 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-linked trips was drawn from ITE and other published information.

The trip generation rates for general commercial and convenience commercial categories are reduced to account for pass-by and diverted trips. General commercial trip rates are based on shopping centers, and new trip data for shopping centers are quite robust. Of the 100 shopping center studies listed in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 60 have information on both pass-by and diverted trips. The average new trip percentage is 42%, excluding all pass-by and diverted trips. Convenience commercial uses are discussed below.

Trip Length Factors

In addition to the number of new trips generated, the length of those trips also affects the impact of a trip, and trip lengths vary between land uses. Average trip lengths are not used directly, but instead are used to develop trip length adjustment factors. The trip length factors are derived from the U.S. Department of Transportation's 2009 National Household Travel Survey (NHTS), and are shown in Table 11.

Table 11. Trip Length Adjustment Factors

Fee Program Land Use Category	NHTS Trip Purpose	Avg. Trip Length (mi.)	Adjustment Factor
Single-Family	Single-Family	9.16	0.99
Multi-Family	Multi-Family	8.30	0.89
Hotel/Motel	Average	9.28	1.00
Commercial/Retail	Shopping	6.27	0.68
Convenience Commercial	n/a*	1.52	0.16
Office	Family/Personal	6.61	0.71
Public/Institutional	School/Church	8.47	0.91
Industrial	To or From Work	11.98	1.29
Warehouse	To or From Work	11.98	1.29
Mini Warehouse	Family/Personal	6.61	0.71
Average	Average	9.28	1.00

* average trip length from Table 13

Source: National average trip lengths from U.S. Department of Transportation, 2009 National Household Travel Survey; adjustment factor is ratio of trip length for the land use category to the average trip length;

Convenience Commercial Category

The convenience commercial category requires some additional analysis. Average daily trip generation data per 1,000 square feet are available for the following three land use categories: Fast Food with Drive-Through (ITE 934), Convenience Market (Open 24 Hours) (ITE 851) and Convenience Market with Gasoline Pumps (ITE 853). Average daily trip generation data are also available per fueling position for Convenience Market with Gasoline Pumps (ITE 853), Gasoline/Service Station (ITE 944), and Gasoline/Service Station with Convenience Market (ITE 945). However, since convenience stores with and without gas pumps tend to have very similar trip generation, it would seem to make more sense to base the fees on building square footage.

Data on pass-by and diverted-linked trips are also available for the same three land use categories. Using the same procedure recommended for general commercial, the new trip percentage excludes both pass-by and diverted trips. The number of new trips that would be generated by each of these three land uses is shown in Table 12. Note that all three land uses have reasonably similar new trip generation. To be conservative, the fee will be based on the lowest of the three.

Table 12. Convenience Commercial Trip Generation Characteristics

ITE Code	Land Use Description	Daily Trip Rate	% New	New Trips	No. of Studies: Trips	No. of Studies: % New
934	Fast Food w/Drive Thru (1,000 sf)	496.12	29.9%	148.34	21	7
853	Convenience Market w/Gasoline Pumps (1,000 sf)	845.60	16.2%	136.99	10	15
851	Convenience Market (Open 24 Hours) (1,000 sf)	737.99	23.9%	176.38	8	11

Source: Trips are average daily trip ends on a weekday from ITE, Trip Generation, 2012; percent new trips from ITE, Trip Generation Handbook, 2004 (excludes pass-by and ½ of diverted-linked trips)

While there are reasonably good national data on trip generation for these uses, there are more limited data on average trip length. However, extensive studies have been done in Florida, and these are summarized in Table 13. Again, to be conservative, the shortest of these average trip lengths will be used.

Table 13. Convenience Commercial Trip Length Characteristics

ITE Code	Land Use Description	Avg. Trip Length (mi.)	No. of Studies
934	Fast Food w/Drive Thru	2.42	16
945	Service Station with Convenience Market	1.57	9
851	Convenience Market (Open 24 Hours)	1.52	9

Source: Tindale-Oliver & Associates, Collier County Transportation Impact Fee Update, February 2009.

Based on the foregoing, a "convenience commercial" use, defined as consisting of fast food restaurants with drive-through windows, convenience stores and gasoline service station (with or without convenience retail sales), has been included in the travel demand schedule.

Travel Demand Schedule

The recommended travel demand schedule for the consolidated land use categories is based on national data, calibrated to local conditions. Average daily trip rates and the reduction for commercial retail uses to account for pass-by and diverted-linked trips are multiplied by new trip and trip length factors to determine "adjusted trips." The "adjusted" trip rates are then multiplied by a calibration factor (described on the following page), to determine "calibrated" trips used in the fee calculations. The recommended travel demand schedule is presented in Table 14.

Table 14. Recommended Travel Demand Schedule

Land Use	Unit	Trip Rate	% New	Length Factor	Adj. Trips	Calibration Factor	Calibrated Trips
Single-Family	Dwelling	9.52	100%	0.99	9.42	1.02	9.61
Multi-Family	Dwelling	6.65	100%	0.89	5.92	1.02	6.04
Hotel/Motel	Room	6.90	100%	1.00	6.90	1.02	7.04
General Commercial	1,000 sf	42.70	42%	0.68	12.20	1.02	12.44
Convenience Comm.	1,000 sf	845.60	16%	0.16	21.65	1.02	22.08
Office	1,000 sf	11.01	100%	0.71	7.82	1.02	7.98
Public/Institutional	1,000 sf	9.11	100%	0.91	8.29	1.02	8.46
Industrial	1,000 sf	6.96	100%	1.29	8.98	1.02	9.16
Warehouse	1,000 sf	3.56	100%	1.29	4.59	1.02	4.68
Mini Warehouse	1,000 sf	2.50	100%	0.71	1.78	1.02	1.82

Source: Trip rate (average daily trip ends on a weekday), and percent new trips for shopping centers, from ITE, Trip Generation Manual, 2012; trip length adjustment factor from Table 11; convenience commercial factors from Table 12 and Table 13; adjusted trips is product of trip rate, percent new trips and trip length factor; calibration factor from Table 15; calibrated trips is product of adjusted trips and calibration factor.

Calibration Factor

To calibrate the travel demand schedule, the "expected" number of trips that would be generated using the adjusted trip rates and the model base year (2010) and 2040 socioeconomic forecasts for the unincorporated area are compared to base year and 2040 modeled trips that are attributable to the unincorporated area (i.e., excluding trips that do not have an origin or destination in the unincorporated area). The results are summarized in Table 15.

The first step is to convert retail, service and basic employees to 1,000 sq. ft., using employee density factors. A weighted average of single-family detached and multi-family trip rates is used for the residential trip rate. The general commercial rate is used for retail, office for service, and the average of industrial and warehouse is used for basic land uses.

The calibration factor is the ratio of modeled to expected trips. Calibration factors were developed for 2010, 2040 and new trips expected over the 2010-2040 period. For 2010 and 2040, expected trips derived from "adjusted" trip rates in the travel demand schedule under-predict modeled trips attributed to the unincorporated area. For new trips expected over the 2010-2040 period, the unadjusted travel demand schedule also under-predicts model trips. Consequently, the 2010-2040 calibration factor is applied to the adjusted trips in the travel demand schedule, resulting in a 2% across-the-board increase from the adjusted trip rates in Table 14 above.

Table 15. Calibration Factor

	Residential	Retail	Service	Basic	Total
2010 Units/Employees	54,552	5,390	34,158	7,161	na
2040 Units/Employees	110,325	13,277	74,423	14,541	na
New Units/Employees	55,773	7,887	40,265	7,380	na
Employees/1,000 sq. ft.	na	0.90	2.31	0.74	na
2010 Units/1,000 sq. ft.	54,552	5,989	14,787	9,677	na
2040 Units/1,000 sq. ft.	110,325	14,752	32,218	19,650	na
New Units/1,000 sq. ft.	55,773	8,763	17,431	9,973	na
Adjusted Trip Rates	8.95	12.20	7.82	6.79	na
Expected 2010 Trip Ends	488,240	73,066	115,634	65,707	742,647
Expected 2040 Trip Ends	987,409	179,974	251,945	133,424	1,552,752
Expected New Trip Ends	499,169	106,909	136,310	67,717	810,105
Modeled 2010 Trip Ends	na	na	na	na	761,470
Modeled 2040 Trip Ends	na	na	na	na	1,585,725
Modeled New Trip Ends	na	na	na	na	824,255
2010 Calibration Factor	na	na	na	na	1.03
2040 Calibration Factor	na	na	na	na	1.02
2010-2040 Calibration Factor	na	na	na	na	1.02

Source: 2010 and 2040 residential units and employees from Felsburg Holt & Ullevig, data from Major Transportation Corridors Plan analysis, September 13, 2016; employees per 1,000 sq. ft. from U.S. Department of Energy, Commercial Buildings Energy Consumption Survey, 2003 (retail includes mall and non-mall, basic is average of industrial and warehouse); adjusted trip rates from Table 14 (residential is weighted 86.6% single-family detached and 13.4% multi-family based on 2010-2014 5-year sample data from the U.S, Census Bureau for unincorporated El Paso County, basic is average of industrial and warehouse); expected trips is product of units/1,000 sq. ft. and adjusted trip rates; modeled trips from Felsburg Holt & Ullevig; calibration factor is ratio of modeled to expected trips.

FEE SCHEDULES

The updated road impact fees for the recommended land use categories calculated in this study are presented in Table 16 for properties not located in a PID. The impact fee calculation for each land use category is the product of daily trip ends per development unit and the net cost per trip end.

Table 16. Road Impact Fee Schedule (Not in PID)

Land Use	Unit	Trips	Net Cost per Trip	Fee per Unit
Single-Family	Dwelling	9.61	$367.49	$3,532
Multi-Family	Dwelling	6.04	$367.49	$2,220
Hotel/Motel	Room	7.04	$367.49	$2,587
General Commercial	1,000 sf	12.44	$367.49	$4,572
Convenience Comm.	1,000 sf	22.08	$367.49	$8,114
Office	1,000 sf	7.98	$367.49	$2,933
Public/Institutional	1,000 sf	8.46	$367.49	$3,109
Industrial	1,000 sf	9.16	$367.49	$3,366
Warehouse	1,000 sf	4.68	$367.49	$1,720
Mini Warehouse	1,000 sf	1.82	$367.49	$669

Source: Trips per unit are calibrated trips ends from Table 14; net cost per trip end from Table 10.

For properties located in a PID, the total fee amount is the same, but it is split between the upfront (or net) fee collected at time of building permit and the portion that will be paid by future PID taxes. Future PID taxes are based on average assessed property values per unit and the relevant millage rate, and the future stream of property tax payments is converted to an equivalent present value. The upfront fee is the difference between the total fee and the present value of future PID taxes, as shown in Table 17.

Table 17. Upfront Road Impact Fee Schedule (In PID)

		Total Fee	5-Mill PID		10-Mill PID	
Land Use	Unit	per Unit	PID Tax	Net Fee	PID Tax	Net Fee
Single-Family	Dwelling	$3,532	$1,303	$2,229	$2,609	$923
Multi-Family	Dwelling	$2,220	$473	$1,747	$949	$1,271
Hotel/Motel	Room	$2,587	$653	$1,934	$1,308	$1,279
General Commercial	1,000 sf	$4,572	$1,107	$3,465	$2,213	$2,359
Convenience Comm.	1,000 sf	$8,114	$3,529	$4,585	$7,051	$1,063
Office	1,000 sf	$2,933	$1,660	$1,273	$3,321	$0
Public/Institutional	1,000 sf	$3,109	$1,727	$1,382	$3,459	$0
Industrial	1,000 sf	$3,366	$1,279	$2,087	$2,558	$808
Warehouse	1,000 sf	$1,720	$743	$977	$1,487	$233
Mini Warehouse	1,000 sf	$669	$482	$187	$968	$0

Source: Gross fee per unit from Table 16; PID tax is net present value of PID taxes over the life of a bond issue from Gregory K. Baum & Company, October 11 and 15, 2012; net fee is difference between total fee and PID tax.

Table 18. Standardized Unit Costs - Segments

Component	Unit	Quantity	Unit Cost	Cost	Source and Notes
Rural Major Collector					**EPC Engineering Criteria Manual Figure 2-7**
Asphalt	ft.	32	$2.92	$93.35	Assumed 6" depth
Shoulder	ea.	2	$13.13	$26.26	Gravel, 6' each side equivalent
Earthwork	cy.	1.204	$2.19	$2.63	5 ft. of cut/fill times 65 ft.
Subtotal				$122.24	
Const. Mgmt.		6%		$7.33	Includes engineering, surveying, soils work
R.O.W.	ft.	80	$0.55	$43.76	Based on EPC school/park fee
Total Cost per Linear Foot				$173.34	
Rural Minor Arterial					**EPC Engineering Criteria Manual Figure 2-5**
Asphalt	ft.	40	$3.40	$136.14	Assumed 7" depth
Shoulder	ea.	2	$13.13	$26.26	Gravel, 6' each side equivalent
Earthwork	cy.	1.574	$2.19	$3.44	00.5 ft. of cut/fill times 85 ft.
Subtotal				$165.84	
Const. Mgmt.		6%		$9.95	Includes engineering, surveying, soils work
R.O.W.	ft.	100	$0.55	$54.70	Based on EPC school/park fee
Total Cost per Linear Foot				$230.49	
Urban Non-residential Collector					**EPC Engineering Criteria Manual Figure 2-14**
Asphalt	ft.	48	$3.40	$163.37	Assumed 7" depth
Shoulder	ea.	2	$13.13	$26.26	Machine pour, Type 1, prep. and backfill
Earthwork	cy.	1.204	$2.19	$2.63	00.5 ft. of cut/fill times 65 ft.
Subtotal				$192.26	
Const. Mgmt.		6%		$11.54	Includes engineering, surveying, soils work
R.O.W.	ft.	80	$0.55	$43.76	Based on EPC school/park fee
Total Cost per Linear Foot				$247.56	
Urban Minor Arterial					**EPC Engineering Criteria Manual Figure 2-13**
Asphalt	ft.	62	$3.89	$241.17	Assumed 8" depth
Shoulder	ea.	2	$13.13	$26.26	Machine pour, Type 1, prep. and backfill
Earthwork	cy.	1.574	$2.19	$3.44	00.5 ft. of cut/fill times 85 ft.
Subtotal				$270.87	
Const. Mgmt.		6%		$16.25	Includes engineering, surveying, soils work
R.O.W.	ft.	100	$0.55	$54.70	Based on EPC school/park fee
Total Cost per Linear Foot				$341.82	
Urban Principal Arterial (4 lanes)					**EPC Engineering Criteria Manual Figure 2-12**
Asphalt	ft.	72	$4.38	$315.07	Assumed 9" depth
Shoulder	ea.	4	$20.24	$80.96	Type 1 curb with 2 4' aprons
Earthwork	cy.	2.130	$2.19	$4.66	0.5 ft. of cut/fill times 115 ft.
Subtotal				$400.69	
Const. Mgmt.		6%		$24.04	Includes engineering, surveying, soils work
R.O.W.	ft.	130	$0.55	$71.11	Based on EPC school/park fee
Total Cost per Linear Foot				$495.84	

Continued on next page.

Table 18. Standardized Unit Costs - Segments, continued

Component	Unit	Quantity	Unit Cost	Cost	Source and Notes
Urban Principal Arterial (6 lanes)					**EPC Engineering Criteria Manual Figure 2-11**
Asphalt	ft.	96	$4.86	$466.77	Assumed 10" depth
Shoulder	ea.	4	$20.24	$80.96	Type 1 curb with 2 4' aprons
Earthwork	cy.	2.685	$2.19	$5.88	0.5 ft. of cut/fill times 145 ft.
Subtotal				$553.60	
Const. Mgmt.		6%		$33.22	Includes engineering, surveying, soils work
R.O.W.	ft.	160	$0.55	$87.52	Based on EPC school/park fee
Total Cost per Linear Foot				$674.34	
Urban Expressway (4 lanes)					**EPC Engineering Criteria Manual Figure 2-10**
Asphalt	ft.	72	$4.86	$350.08	Assumed 10" depth
Shoulder	ea.	4	$20.24	$80.96	Type 1 curb with 2 4' aprons
Earthwork	cy.	2.315	$2.19	$5.06	0.5 ft. of cut/fill times 125 ft.
Subtotal				$436.10	
Const. Mgmt.		6%		$26.17	Includes engineering, surveying, soils work
R.O.W.	ft.	140	$0.55	$76.58	Based on EPC school/park fee
Total Cost per Linear Foot				$538.85	
Urban Expressway (6 lanes)					**EPC Engineering Criteria Manual Figure 2-9**
Asphalt	ft.	96	$4.86	$466.77	Assumed 10" depth
Shoulder	ea.	4	$20.24	$80.96	Type 1 curb with 2 4' aprons
Earthwork	cy.	2.7	$2.19	$5.88	0.5 ft. of cut/fill times 145 ft.
Subtotal				$553.60	
Const. Mgmt.		6%		$33.22	Includes engineering, surveying, soils work
R.O.W.	ft.	160	$0.55	$87.52	Based on EPC school/park fee
Total Cost per Linear Foot				$674.34	
Rural Principal Arterial (4 lane)					**EPC Engineering Criteria Manual Figure 2-4**
Asphalt	ft.	76	$4.13	$314.10	Assumed 8.5" depth
Shoulder	ea.	4	$10.94	$43.76	4' X 10" shoulder tapered to nothing at 4'
Earthwork	cy.	2.685	$2.19	$5.88	0.5 ft. of cut/fill times 145 ft.
Subtotal				$363.73	
Const. Mgmt.		6%		$21.82	Includes engineering, surveying, soils work
R.O.W.	ft.	180	$0.55	$98.46	Based on EPC school/park fee
Total Cost per Linear Foot				$484.02	
Rural Principal Arterial (6 lane)					**EPC Engineering Criteria Manual Figure 2-3**
Asphalt	ft.	112	$4.86	$544.57	Assumed 10" depth
Shoulder	ea.	4	$10.94	$43.76	4' X 10" shoulder tapered to nothing at 4'
Earthwork	cy.	3.519	$2.19	$7.70	0.5 ft. of cut/fill times 190 ft.
Subtotal				$596.03	
Const. Mgmt.		6%		$35.76	Includes engineering, surveying, soils work
R.O.W.	ft.	210	$0.55	$114.87	Based on EPC school/park fee
Total Cost per Linear Foot				$746.66	

Continued on next page.

Table 18. Standardized Unit Costs - Segments, continued

Component	Unit	Quantity	Unit Cost	Cost	Source and Notes
Rural Expressway (4 lane)					**EPC Engineering Criteria Manual Figure 2-2**
Asphalt	ft.	76	$4.38	$332.58	Assumed 9" depth
Shoulder	ea.	4	$10.94	$43.76	4' X 10" shoulder tapered to nothing at 4'
Earthwork	cy.	3.1	$2.19	$6.69	0.5 ft. of cut/fill times 165 ft.
Subtotal				$383.02	
Const. Mgmt.		6%		$22.98	Includes engineering, surveying, soils work
R.O.W.	ft.	180	$0.55	$98.46	Based on EPC school/park fee
Total Cost per Linear Foot				$504.46	
Rural Expressway (6 lane)					**EPC Engineering Criteria Manual Figure 2-1**
Asphalt	ft.	112	$4.38	$490.11	Assumed 9" depth
Shoulder	ea.	4	$10.94	$43.76	4' X 10" shoulder tapered to nothing at 4'
Earthwork	cy.	3.519	$2.19	$7.70	0.5 ft. of cut/fill times 190 ft.
Subtotal				$541.57	
Const. Mgmt.		6%		$32.49	Includes engineering, surveying, soils work
R.O.W.	ft.	210	$0.55	$114.87	Based on EPC school/park fee
Total Cost per Linear Foot				$688.94	
State Road, Type A (4 lane divided)					**CDOT Standard Plans Figure 4-1**
Asphalt	ft.	76	$4.13	$314.10	Assumed 8.5" depth
Shoulder	ea.	0	$0.00	$0.00	Not used by CDOT
Earthwork	cy.	2.7	$2.19	$5.91	0.5 ft. of cut/fill times 145 ft.
Subtotal				$320.01	
Const. Mgmt.		6%		$19.20	Includes engineering, surveying, soils work
R.O.W.	ft.	180	$0.55	$98.46	Based on EPC school/park fee
Total Cost per Linear Foot				$437.67	
State Road, Type AA (6 lane divided)					**CDOT Standard Plans Figure 4-1**
Asphalt	ft.	112	$4.86	$544.57	Assumed 10" depth
Shoulder	ea.	0	$0.00	$0.00	Not used by CDOT
Earthwork	cy.	3.500	$2.19	$7.66	0.5 ft. of cut/fill times 190 ft.
Subtotal				$552.23	
Const. Mgmt.		6%		$33.13	Includes engineering, surveying, soils work
R.O.W.	ft.	210	$0.55	$114.87	Based on EPC school/park fee
Total Cost per Linear Foot				$700.23	

Source: Components, units, quantities and notes from Table 16 in Duncan Associates/LSA Associates, Major Transportation Corridors Plan: Road Impact Fee Study, November 2012, unit costs increased by a cost inflation factor of 9.4%, as recommended by the Oversizing and Reimbursement Committee, June 7, 2016.

The standardized unit cost for intersections used in the fee calculations are shown in Table 19. These costs are per intersection leg. A standard four-way intersection will have four intersection legs.

Table 19. Standardized Unit Costs - Intersection Legs

Component	Unit	Quantity	Unit Cost	Cost	Source and Notes
Urban Minor Arterial					
Asphalt	cu. yards	752	$157.54	$118,483	Assumed 8" depth
Curb	linear feet	880	$13.13	$11,553	Machine pour, Type 1, prep. and backfill
Earthwork	cu. yards	771	$2.19	$1,687	Used 0.5 ft. of cut/fill times 85 ft.
Subtotal				$131,722	
Const. Mgmt.		6%		$7,903	Includes engineering, surveying, soils work
R.O.W.	sq. feet	47,180	$0.55	$25,807	Based on EPC school/park fee
Total Cost of Intersection Leg				$165,433	
– Base Cost	feet	440	$341.82	-$150,401	From Appendix A: Standardized Unit Costs
Additional Cost of Intersection Leg				$15,032	
Urban Principal Arterial (4 Lanes), 1 Left Turn Lane					
Asphalt	cu. yards	1,451	$157.54	$228,537	Assumed 8" depth
Curb	linear feet	2,060	$20.24	$41,692	Machine pour, Type 1, prep. and backfill
Earthwork	cu. yards	1,288	$2.19	$2,818	Used 0.5 ft. of cut/fill times 85 ft.
Subtotal				$273,047	
Const. Mgmt.		6%		$16,383	Includes engineering, surveying, soils work
R.O.W.	sq. feet	77,300	$0.55	$42,283	Based on EPC school/park fee
Total Cost of Intersection Leg				$331,713	
– Base Cost	feet	515	$495.84	-$255,358	From Appendix A: Standardized Unit Costs
Additional Cost of Intersection Leg				$76,355	
Urban Principal Arterial (4 Lanes), 2 Left Turn Lanes					
Asphalt	cu. yards	2,152	$157.54	$338,987	Assumed 8" depth
Curb	linear feet	3,020	$20.24	$61,122	Machine pour, Type 1, prep. and backfill
Earthwork	cu. yards	1,984	$2.19	$4,341	Used 0.5 ft. of cut/fill times 85 ft.
Subtotal				$404,450	
Const. Mgmt.		6%		$24,267	Includes engineering, surveying, soils work
R.O.W.	sq. feet	118,150	$0.55	$64,628	Based on EPC school/park fee
Total Cost of Intersection Leg				$493,345	
– Base Cost	feet	755	$495.84	-$374,359	From Appendix A: Standardized Unit Costs
Additional Cost of Intersection Leg				$118,986	
Urban Principal Arterial (6 Lanes)					
Asphalt	cu. yards	2,389	$157.54	$376,346	Assumed 8" depth
Curb	linear feet	2,300	$20.24	$46,550	Machine pour, Type 1, prep. and backfill
Earthwork	cu. yards	1,751	$2.19	$3,831	Used 0.5 ft. of cut/fill times 85 ft.
Subtotal				$426,727	
Const. Mgmt.		6%		$25,604	Includes engineering, surveying, soils work
R.O.W.	sq. feet	103,190	$0.55	$56,445	Based on EPC school/park fee
Total Cost of Intersection Leg				$508,776	
– Base Cost	feet	575	$674.34	-$387,746	From Appendix A: Standardized Unit Costs
Additional Cost of Intersection Leg				$121,030	

Source: Components, units, quantities and notes from Table 17 in Duncan Associates/LSA Associates, Major Transportation Corridors Plan: Road Impact Fee Study, November 2012; unit costs from 2012 study, inflated by 9.4% per the recommendation of the Oversizing and Reimbursement Committee, June 7, 2016.

Table 20. Planned Improvement Descriptions and Traffic Volumes

Corridor	From	To	Mi.	Lanes Ex	Lanes Fut	Type	Class Ex	Class Fut	2016 Cap.	2016 Trips	2040 Trips
Enoch Rd	SH 94	Schriever	1.459	2	4	Rural	C	PA	8,000	4,500	27,800
Marksheffel Rd	Stetson Hills	2000 ft north	0.379	2	4	Urban	PA	PA	18,000	11,000	21,000
Marksheffel Rd	Barnes Rd	Carefree Cir N	0.952	2	4	Urban	PA	PA	18,000	17,600	34,000
Marksheffel Rd	0.5 mi. N/of Fontaine	Link Rd	3.101	2	4	Rural	MA	MA	14,000	14,600	19,300
Fontaine	Marksheffel Rd	Easy St	4.739	2	4	Urban	MA	MA	14,000	3,000	20,500
Bradley Rd	Academy Blvd	Hancock Expy	0.978	2	4	Urban	PA	PA	18,000	12,000	19,800
Academy Blvd	I-25	Bradley Rd	0.793	4	6	Urban	EX	EX	48,000	61,100	96,100
Woodmen Rd	Marksheffel	Banning Lewis	1.305	4	6	Urban	PA	EX	36,000	22,000	39,000
Walker Rd	SH 83	Steppler Rd	2.325	2	4	Rural	C	MA	8,000	2,300	17,900
Meridan Rd	Murphy Rd	Rex Rd	3.399	2	4	Rural	C	MA	8,000	4,800	16,100
Black Forest Rd	Stapleton Dr	Research	0.739	2	4	Urban	MA	MA	14,000	6,500	18,200
Stapleton Dr	Towner	US 24	4.257	2	4	Urban	PA	PA	18,000	2,000	17,000
Vollmer Rd	Marksheffel	Stapleton Dr	1.255	2	4	Rural	C	MA	8,000	2,500	8,700
Judge Orr Rd	Eastonville Rd	Peyton Hwy	6.038	2	4	Rural	MA	MA	12,000	2,700	13,600
Hwy 105	Knollwood Blvd	SH83	5.059	2	4	Rural	PA	PA	18,000	5,900	16,500
Grinnell Blvd	Powers Blvd	Bradley Rd	0.608	2	4	Rural	MA	MA	12,000	10,700	18,000
Subtotal, County Arterials			37.386								
Roller Coaster Rd	Eliminate jog in alignment		0.823	0	2	Rural	0	MA	0	0	6,700
Black Forest Rd	Eliminate jog in alignment		0.535	0	2	Rural	0	MA	0	0	13,800
Hodgen Rd	Eastonville Rd	Elbert Rd	1.246	0	2	Rural	0	C	0	0	5,200
Rex Rd	Terminus	Eastonville Rd	1.200	0	2	Urban	0	C	0	0	600
Stapleton Dr	Towner Rd	Black Forest Rd	4.040	0	4	Urban	0	PA	0	0	22,500
Woodmen Hills Rd	Stapleton	Raygor Rd	2.522	0	2	Urban	0	C	0	0	200
Peyton Hwy	Judge Orr	Falcon Hwy	2.368	0	2	Rural	0	C	0	0	4,100
Howell Lane	Bridge at Kettle Crk		0.714	0	2	Rural	0	C	0	0	1,200
Meridan Rd	Bradley Rd	Mesa Ridge Pky	3.250	0	2	Rural	0	MA	0	0	3,000
Mesa Ridge Pkwy	Marksheffel	Meridian Rd ext	1.537	0	2	Rural	0	MA	0	0	7,100
Fontaine Blvd	Terminus	Meridian Rd ext	1.209	0	2	Urban	0	MA	0	0	2,700
Marksheffel Rd	Woodmen Rd	Research Pkwy	1.016	0	4	Urban	0	PA	0	0	7,500
Banning Lewis	Woodmen Rd	Stapleton	0.793	0	4	Urban	0	PA	0	0	15,000
Mesa Ridge Pkwy	Powers Blvd	Marksheffel Rd	1.298	0	2	Urban	0	PA	0	0	12,000
Tutt Blvd Ext	Dublin Blvd	Templeton Gap	0.332	0	4	Urban	0	PA	0	0	8,000
Furrow Rd Ext	Lamplighter Dr	Higby Rd	0.301	0	2	Urban	0	C	0	0	5,200
Bradley Rd	Grinnell Blvd	Powers Blvd	1.391	0	2	Urban	0	MA	0	0	9,100
Subtotal, New County Connections			24.575								
Curtis Rd	US 24	SH 94	8.025	2	2	Rural	U	PA	6,000	3,900	15,500
Curtis Rd	SH 94	Drennan Rd	6.091	2	2	Rural	U	MA	6,000	2,700	11,500
Bradley Rd	COS City Limit	Curtis Rd	4.587	2	2	Rural	U	MA	6,000	2,100	11,200
Old Pueblo Rd	Fountain City Lmts	I-25	5.725	2	2	Rural	U	C	6,000	420	6,600
Falcon Hwy	US 24	1 mi E/of Curtis	4.529	2	2	Rural	U	MA	6,000	4,800	12,100
Hodgen Rd	Goshawk Rd	Eastonville Rd	3.521	2	2	Rural	U	PA	6,000	2,500	10,400
Baptist Rd	Desiree Dr	Roller Coaster Rd	1.943	2	2	Rural	U	C	6,000	1,100	7,200
Hodgen Rd	Black Forest Rd	Bar X Rd	1.112	2	2	Rural	U	MA	6,000	4,000	12,000
Hodgen Rd	Roller Coaster	SH 83	1.082	2	2	Rural	U	MA	6,000	5,500	7,200
Meridian Rd	Hodgen Rd	Murphy Rd	2.192	2	2	Rural	U	MA	6,000	2,400	7,000
Black Forest Rd	Hodgen Rd	Stapleton Dr	6.352	2	2	Rural	U	MA	6,000	4,800	13,400

Continued on next page.

Table 20. Planned Improvement Descriptions and Traffic Volumes, continued

Corridor	From	To	Mi.	Lanes Ex	Lanes Fut	Type	Class Ex	Class Fut	LOS D Cap.	2016 Trips	2040 Trips
Vollmer Rd	Stapleton Dr	Shoup Rd	3.236	2	2	Rural	U	MA	6,000	2,500	8,700
Shoup Rd	SH 83	Black Forest Rd	4.216	2	2	Rural	U	MA	6,000	4,200	10,800
Milam Rd	Shoup Rd	Old Ranch Rd	1.961	2	2	Rural	U	MA	6,000	2,400	11,300
Walker Rd	Steppler Rd	Black Forest Rd	2.006	2	2	Rural	U	MA	6,000	1,100	9,000
Roller Coaster Rd	Hodgen Rd	Old Northgate Rd	3.521	2	2	Rural	U	MA	6,000	1,500	7,000
Higby Rd	Cloverleaf Rd	Rollarcoaster Rd	1.831	2	2	Urban	U	MA	6,000	1,600	6,100
Beacon Lite Rd	SH 105	County Line Rd	1.790	2	2	Rural	U	C	6,000	3,300	8,200
Eastonville Rd	Mclaughlin Rd	Latigo Blvd	5.528	2	2	Rural	U	MA	6,000	2,600	4,800
Monument Hill	Woodmoor Dr	County Line Rd	2.005	2	2	Rural	U	C	6,000	4,900	8,800
Deer Creek Rd	Monument Hill	Woodmen Dr	0.360	2	2	Rural	U	C	6,000	2,300	5,000
Subtotal, Rural Road Upgrades			71.613								
Black Forest Rd	Walker Rd	County Line Rd	2.451	2	2	Rural	G	U	300	380	400
Walker Rd	Black Forest Rd	Meridian Rd	5.896	2	2	Rural	G	U	300	60	2,200
Sweet Rd	Peyton Hwy	Ellicott Hwy	8.014	2	2	Rural	G	U	300	140	600
Harrisville Rd	Blasingame Rd	Ramah Hwy	2.008	2	2	Rural	G	U	300	320	500
Funk Rd	Calhan Hwy	Ramah Hwy	7.954	2	2	Rural	G	U	300	250	2,000
Eastonville Rd	Eastonville Loop	Londonderry Dr	0.995	2	2	Rural	G	U	300	200	5,400
Blaney Rd S	Meridan Rd	Hoofbeat Rd	1.411	2	2	Rural	G	U	300	325	3,600
Drennan Rd	Curtis Rd	Ellicott Hwy	8.966	2	2	Rural	G	U	300	100	3,500
Sanborn Rd	Ellicott Hwy	Baggett Rd	1.964	2	2	Rural	G	U	300	100	1,400
Log Rd	90 degree bend	SH 94	1.945	2	2	Rural	G	U	300	365	1,400
Latigo Blvd	Eastonville Rd	Elbert Rd	1.626	2	2	Rural	G	U	300	80	400
Hoofbeat	Blaney Rd S	SH 94	3.456	2	2	Rural	G	U	300	160	2,700
Soap Weed Rd	South of US 24	Beg. of paving	3.130	2	2	Rural	G	U	300	150	800
Subtotal, Rural Road Paving			49.816								
Total, County Road Improvements			183.390								
SH 94	City Limits	Slocum Rd	6.143	2	4	Rural	PA	PA	18,000	8,600	30,500
US 83	Shoup Rd	Northgate Rd	1.656	4	6	Rural	PA	PA	36,000	16,000	54,000
US 24	31st St	Manitou Interchg	1.063	4	4	Urban	PA	FW	36,000	40,500	58,500
US 24	Marksheffel	Constitution	1.277	4	6	Urban	PA	EX	36,000	6,897	40,000
US 24	Garrett Rd	Woodmen Rd	2.329	4	6	Rural	PA	PA	36,000	13,000	39,000
US 83	Northgate	Hodgen Rd	2.614	2	4	Rural	PA	PA	18,000	6,800	36,000
Total, State Roads			15.082								
Grand Total, All Improvements			198.472								

Notes: Classifications are Freeway (FW), Expressway (EX), Principal Arterial (PA), Minor Arterial (MA), Collector (C), Unimproved (U), and Gravel (G)

Source: Felsburg Holt & Ullevig, November 14, 2016.

Table 21. Planned Improvement Project Data

Corridor	From	To	Cost/ Lin. Foot	Intersections Cost/Leg	Legs	No. of Signals	% Defic.	% Thru
Enoch Rd	SH 94	Schriever	$484.02	$15,032	1	0	0.0%	0.0%
Marksheffel Rd	Stetson Hills	2000 ft north	$495.84	$76,355	4	0	0.0%	45.0%
Marksheffel Rd	Barnes Rd	Carefree Cir N	$495.84	$76,355	4	0	0.0%	48.0%
Marksheffel Rd	0.5 mi. N/of Fontaine	Link Rd	$484.02	$15,032	2	0	0.0%	27.0%
Fontaine	Marksheffel Rd	Easy St	$495.84	$76,355	4	0	0.0%	24.0%
Bradley Rd	Academy Blvd	Hancock Expy	$495.84	$76,355	2	0	0.0%	3.0%
Academy Blvd	I-25	Bradley Rd	$674.34	$121,030	0	0	37.4%	22.0%
Woodmen Rd	Marksheffel	Banning Lewis	$674.34	$121,030	4	0	0.0%	2.0%
Walker Rd	SH 83	Steppler Rd	$484.02	$15,032	3	0	0.0%	14.0%
Meridan Rd	Murphy Rd	Rex Rd	$484.02	$15,032	0	0	0.0%	0.0%
Black Forest Rd	Stapleton Dr	Research	$495.84	$15,032	4	0	0.0%	9.0%
Stapleton Dr	Towner	US 24	$674.34	$76,355	3	0	0.0%	3.0%
Vollmer Rd	Marksheffel	Stapleton Dr	$484.02	$15,032	2	0	0.0%	0.0%
Judge Orr Rd	Eastonville Rd	Peyton Hwy	$484.02	$15,032	2	0	0.0%	0.0%
Hwy 105	Knollwood Blvd	SH83	$484.02	$76,355	5	0	0.0%	4.0%
Grinnell Blvd	Powers Blvd	Bradley Rd	$484.02	$15,032	2	0	0.0%	30.0%
Subtotal, County Arterials					42	0		
Roller Coaster Rd	Eliminate jog in alignment*		n/a	$15,032	2	0	0.0%	4.0%
Black Forest Rd	Eliminate jog in alignment*		n/a	$15,032	1	0	0.0%	12.0%
Hodgen Rd	Eastonville Rd	Elbert Rd	$173.34	$15,032	0	0	0.0%	14.0%
Rex Rd	Terminus	Eastonville Rd	$247.56	$15,032	0	0	0.0%	0.0%
Stapleton Dr	Towner Rd	Black Forest Rd	$495.84	$76,355	0	0	0.0%	3.0%
Woodmen Hills Rd	Stapleton	Raygor Rd	$247.56	$15,032	0	0	0.0%	0.0%
Peyton Hwy	Judge Orr	Falcon Hwy	$247.56	$15,032	0	0	0.0%	1.0%
Howell Lane	Bridge at Kettle Crk*		n/a	$15,032	0	0	0.0%	0.0%
Meridan Rd	Bradley Rd	Mesa Ridge Pky	$230.49	$15,032	4	0	0.0%	0.0%
Mesa Ridge Pkwy	Marksheffel	Meridian Rd ext	$230.49	$15,032	4	0	0.0%	0.0%
Fontaine Blvd	Terminus	Meridian Rd ext	$341.82	$15,032	1	0	0.0%	0.0%
Marksheffel Rd	Woodmen Rd	Research Pkwy	$495.84	$76,355	4	0	0.0%	26.0%
Banning Lewis	Woodmen Rd	Stapleton	$495.84	$76,355	3	0	0.0%	0.0%
Mesa Ridge Pkwy	Powers Blvd	Marksheffel Rd	$341.82	$76,355	2	0	0.0%	14.0%
Tutt Blvd Ext	Dublin Blvd	Templeton Gap	$495.84	$76,355	1	0	0.0%	17.0%
Furrow Rd Ext	Lamplighter Dr	Higby Rd	$247.56	$15,032	0	0	0.0%	0.0%
Bradley Rd	Grinnell Blvd	Powers Blvd	$341.82	$15,032	0	0	0.0%	4.0%
Subtotal, New County Connections					22	0		
Curtis Rd	US 24	SH 94	$188.30	$76,355	5	0	0.0%	0.0%
Curtis Rd	SH 94	Drennan Rd	$188.30	$15,032	3	0	0.0%	0.0%
Bradley Rd	COS City Limit	Curtis Rd	$188.30	$15,032	3	0	0.0%	0.0%
Old Pueblo Rd	Fountain City Lmts	I-25	$188.30	$15,032	0	0	0.0%	1.0%
Falcon Hwy	US 24	1 mi E/of Curtis	$188.30	$76,355	2	0	0.0%	0.0%
Hodgen Rd	Goshawk Rd	Eastonville Rd	$188.30	$76,355	2	0	0.0%	0.0%
Baptist Rd	Desiree Dr	Roller Coaster Rd	$188.30	$15,032	1	0	0.0%	10.0%
Hodgen Rd	Black Forest Rd	Bar X Rd	$188.30	$15,032	3	0	0.0%	5.0%
Hodgen Rd	Roller Coaster	SH 83	$188.30	$15,032	2	0	0.0%	10.0%
Meridian Rd	Hodgen Rd	Murphy Rd	$188.30	$15,032	3	0	0.0%	0.0%
Black Forest Rd	Hodgen Rd	Stapleton Dr	$188.30	$15,032	3	0	0.0%	12.0%

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Table 21. Planned Improvement Project Data, continued

Corridor	From	To	Cost/ Lin. Foot	Intersections Cost/Leg	Intersections Legs	No. of Signals	% Defic.	% Thru
Vollmer Rd	Stapleton Dr	Shoup Rd	$188.30	$15,032	5	0	0.0%	0.0%
Shoup Rd	SH 83	Black Forest Rd	$188.30	$15,032	4	0	0.0%	0.0%
Milam Rd	Shoup Rd	Old Ranch Rd	$188.30	$15,032	1	0	0.0%	0.0%
Walker Rd	Steppler Rd	Black Forest Rd	$188.30	$15,032	2	0	0.0%	14.0%
Roller Coaster Rd	Hodgen Rd	Old Northgate Rd	$188.30	$15,032	1	0	0.0%	17.0%
Higby Rd	Cloverleaf Rd	Rollarcoaster Rd	$188.30	$15,032	0	0	0.0%	4.0%
Beacon Lite Rd	SH 105	County Line Rd	$188.30	$15,032	0	0	0.0%	0.0%
Eastonville Rd	Mclaughlin Rd	Latigo Blvd	$188.30	$15,032	4	0	0.0%	0.0%
Monument Hill	Woodmoor Dr	County Line Rd	$188.30	$15,032	2	0	0.0%	72.0%
Deer Creek Rd	Monument Hill	Woodmen Dr	$188.30	$15,032	2	0	0.0%	75.0%
Subtotal, Rural Road Upgrades					48	0		
Black Forest Rd	Walker Rd	County Line Rd	$62.16	n/a	0	0	100.0%	14.0%
Walker Rd	Black Forest Rd	Meridian Rd	$62.16	n/a	0	0	0.0%	1.0%
Sweet Rd	Peyton Hwy	Ellicott Hwy	$62.16	n/a	0	0	0.0%	71.0%
Harrisville Rd	Blasingame Rd	Ramah Hwy	$62.16	n/a	0	0	11.1%	0.0%
Funk Rd	Calhan Hwy	Ramah Hwy	$62.16	n/a	0	0	0.0%	0.0%
Eastonville Rd	Eastonville Loop	Londonderry Dr	$62.16	n/a	0	0	0.0%	0.0%
Blaney Rd S	Meridan Rd	Hoofbeat Rd	$62.16	n/a	0	0	0.8%	0.0%
Drennan Rd	Curtis Rd	Ellicott Hwy	$62.16	n/a	0	0	0.0%	0.0%
Sanborn Rd	Ellicott Hwy	Baggett Rd	$62.16	n/a	0	0	0.0%	0.0%
Log Rd	90 degree bend	SH 94	$62.16	n/a	0	0	6.3%	3.0%
Latigo Blvd	Eastonville Rd	Elbert Rd	$62.16	n/a	0	0	0.0%	0.0%
Hoofbeat	Blaney Rd S	SH 94	$62.16	n/a	0	0	0.0%	0.0%
Soap Weed Rd	South of US 24	Beg. of paving	$62.16	n/a	0	0	0.0%	0.0%
Subtotal, Rural Road Paving					0	0		
Subtotal, County Road Improvements					112	0		
SH 94	City Limits	Slocum Rd	$437.67	$76,355	5	2	0.0%	0.0%
US 83	Shoup Rd	Northgate Rd	$700.23	$121,030	3	1	0.0%	29.0%
US 24	31st St	Manitou Interchg	$437.67	$76,355	0	0	25.0%	75.0%
US 24	Marksheffel	Constitution	$700.23	$121,030	4	0	0.0%	18.0%
US 24	Garrett Rd	Woodmen Rd	$700.23	$121,030	6	1	0.0%	8.0%
US 83	Northgate	Hodgen Rd	$437.67	$76,355	3	1	0.0%	11.0%
Subtotal, State Roads					21	5		
Total, All Improvements					133	5		

* no unit cost available

Source: Costs per linear foot from Table 18; costs per intersection leg from Table 19; number of needed legs and signals and percent pass-through traffic from Felsburg Holt & Ullevig, data from Major Transportation Corridors Plan analysis, November 14, 2016; percent deficiency based volume and capacity data from Table 20; planned State road signals are at SH 94/Curtis, SH 94/Enoch, US 83/Shoup, US 24/Falcon Highway, and US 83/Hodgen.

Table 22. Planned Improvement Costs

Corridor	From	To	Segment Cost	Intersecs/ Signals	Less Deficiencies	Less Thru Trips	Total Net Cost
Enoch Rd	SH 94	Schriever	$3,728,658	$15,032	$0	$0	$3,743,690
Marksheffel Rd	Stetson Hills	2000 ft north	$992,235	$305,420	$0	-$583,945	$713,710
Marksheffel Rd	Barnes Rd	Carefree Cir N	$2,492,370	$305,420	$0	-$1,342,939	$1,454,851
Marksheffel Rd	0.5 mi. N/of Fontaine	Link Rd	$7,924,995	$30,064	$0	-$2,147,866	$5,807,193
Fontaine	Marksheffel Rd	Easy St	$12,406,869	$305,420	$0	-$3,050,949	$9,661,340
Bradley Rd	Academy Blvd	Hancock Expy	$2,560,438	$152,710	$0	-$81,394	$2,631,754
Academy Blvd	I-25	Bradley Rd	$2,823,489	$0	-$1,055,985	-$621,168	$1,146,336
Woodmen Rd	Marksheffel	Banning Lewis	$4,646,472	$484,120	$0	-$102,612	$5,027,980
Walker Rd	SH 83	Steppler Rd	$5,941,830	$45,096	$0	-$838,170	$5,148,756
Meridan Rd	Murphy Rd	Rex Rd	$8,686,571	$0	$0	$0	$8,686,571
Black Forest Rd	Stapleton Dr	Research	$1,934,728	$60,128	$0	-$179,537	$1,815,319
Stapleton Dr	Towner	US 24	$15,157,113	$229,065	$0	-$461,585	$14,924,593
Vollmer Rd	Marksheffel	Stapleton Dr	$3,207,310	$30,064	$0	$0	$3,237,374
Judge Orr Rd	Eastonville Rd	Peyton Hwy	$15,430,867	$30,064	$0	$0	$15,460,931
Hwy 105	Knollwood Blvd	SH83	$12,928,910	$381,775	$0	-$532,427	$12,778,258
Grinnell Blvd	Powers Blvd	Bradley Rd	$1,553,820	$30,064	$0	-$475,165	$1,108,719
Subtotal, County Arterials			$102,416,675	$2,404,442	-$1,055,985	-$10,417,757	$93,347,375
Roller Coaster Rd	Eliminate jog in alignment*		$4,117,667	$30,064	$0	-$165,909	$3,981,822
Black Forest Rd	Eliminate jog in alignment*		$2,584,670	$15,032	$0	-$311,964	$2,287,738
Hodgen Rd	Eastonville Rd	Elbert Rd	$1,140,383	$0	$0	-$159,654	$980,729
Rex Rd	Terminus	Eastonville Rd	$1,568,540	$0	$0	$0	$1,568,540
Stapleton Dr	Towner Rd	Black Forest Rd	$10,576,862	$0	$0	-$317,306	$10,259,556
Woodmen Hills Rd	Stapleton	Raygor Rd	$3,296,549	$0	$0	$0	$3,296,549
Peyton Hwy	Judge Orr	Falcon Hwy	$3,095,253	$0	$0	-$30,953	$3,064,300
Howell Lane	Bridge at Kettle Crk*		$8,129,910	$0	$0	$0	$8,129,910
Meridan Rd	Bradley Rd	Mesa Ridge Pky	$3,955,208	$60,128	$0	$0	$4,015,336
Mesa Ridge Pkwy	Marksheffel	Meridian Rd ext	$1,870,509	$60,128	$0	$0	$1,930,637
Fontaine Blvd	Terminus	Meridian Rd ext	$2,182,015	$15,032	$0	$0	$2,197,047
Marksheffel Rd	Woodmen Rd	Research Pkwy	$2,659,924	$305,420	$0	-$770,989	$2,194,355
Banning Lewis	Woodmen Rd	Stapleton	$2,076,102	$229,065	$0	$0	$2,305,167
Mesa Ridge Pkwy	Powers Blvd	Marksheffel Rd	$2,342,643	$152,710	$0	-$349,349	$2,146,004
Tutt Blvd Ext	Dublin Blvd	Templeton Gap	$869,188	$76,355	$0	-$160,742	$784,801
Furrow Rd Ext	Lamplighter Dr	Higby Rd	$393,442	$0	$0	$0	$393,442
Bradley Rd	Grinnell Blvd	Powers Blvd					
Subtotal, New County Connections			$50,858,865	$943,934	$0	-$2,266,866	$49,535,933
Curtis Rd	US 24	SH 94	$7,978,648	$381,775	$0	$0	$8,360,423
Curtis Rd	SH 94	Drennan Rd	$6,056,105	$45,096	$0	$0	$6,101,201
Bradley Rd	COS City Limit	Curtis Rd	$4,560,779	$45,096	$0	$0	$4,605,875
Old Pueblo Rd	Fountain City Lmts	I-25	$5,691,641	$0	$0	-$56,916	$5,634,725
Falcon Hwy	US 24	1 mi E/of Curtis	$4,502,840	$152,710	$0	$0	$4,655,550
Hodgen Rd	Goshawk Rd	Eastonville Rd	$3,500,663	$152,710	$0	$0	$3,653,373
Baptist Rd	Desiree Dr	Roller Coaster Rd	$1,931,393	$15,032	$0	-$194,643	$1,751,782
Hodgen Rd	Black Forest Rd	Bar X Rd	$1,105,509	$45,096	$0	-$57,530	$1,093,075
Hodgen Rd	Roller Coaster	SH 83	$1,076,082	$30,064	$0	-$110,615	$995,531
Meridian Rd	Hodgen Rd	Murphy Rd	$2,178,857	$45,096	$0	$0	$2,223,953
Black Forest Rd	Hodgen Rd	Stapleton Dr	$6,315,450	$45,096	$0	-$763,266	$5,597,280

Continued on next page.

Table 22. Planned Improvement Costs, continued

Corridor	From	To	Segment Cost	Intersecs/ Signals	Less Deficiencies	Less Thru Trips	Total Net Cost
Vollmer Rd	Stapleton Dr	Shoup Rd	$3,217,106	$75,160	$0	$0	$3,292,266
Shoup Rd	SH 83	Black Forest Rd	$4,191,513	$60,128	$0	$0	$4,251,641
Milam Rd	Shoup Rd	Old Ranch Rd	$1,949,457	$15,032	$0	$0	$1,964,489
Walker Rd	Steppler Rd	Black Forest Rd	$1,994,801	$30,064	$0	-$283,481	$1,741,384
Roller Coaster Rd	Hodgen Rd	Old Northgate Rd	$3,500,663	$15,032	$0	-$597,668	$2,918,027
Higby Rd	Cloverleaf Rd	Rollarcoaster Rd	$1,820,848	$0	$0	-$72,834	$1,748,014
Beacon Lite Rd	SH 105	County Line Rd	$1,779,247	$0	$0	$0	$1,779,247
Eastonville Rd	Mclaughlin Rd	Latigo Blvd	$5,496,070	$60,128	$0	$0	$5,556,198
Monument Hill	Woodmoor Dr	County Line Rd	$1,993,419	$30,064	$0	-$1,456,908	$566,575
Deer Creek Rd	Monument Hill	Woodmen Dr	$357,921	$30,064	$0	-$290,989	$96,996
Subtotal, Rural Road Upgrades			$71,199,012	$1,273,443	$0	-$3,884,850	$68,587,605
Black Forest Rd	Walker Rd	County Line Rd	$804,430	$0	-$804,430	$0	$0
Walker Rd	Black Forest Rd	Meridian Rd	$1,935,096	$0	$0	-$19,351	$1,915,745
Sweet Rd	Peyton Hwy	Ellicott Hwy	$2,630,233	$0	$0	-$1,867,465	$762,768
Harrisville Rd	Blasingame Rd	Ramah Hwy	$659,035	$0	-$73,153	$0	$585,882
Funk Rd	Calhan Hwy	Ramah Hwy	$2,610,541	$0	$0	$0	$2,610,541
Eastonville Rd	Eastonville Loop	Londonderry Dr	$326,564	$0	$0	$0	$326,564
Blaney Rd S	Meridan Rd	Hoofbeat Rd	$463,097	$0	-$3,705	$0	$459,392
Drennan Rd	Curtis Rd	Ellicott Hwy	$2,942,684	$0	$0	$0	$2,942,684
Sanborn Rd	Ellicott Hwy	Baggett Rd	$644,594	$0	$0	$0	$644,594
Log Rd	90 degree bend	SH 94	$638,358	$0	-$40,217	-$17,944	$580,197
Latigo Blvd	Eastonville Rd	Elbert Rd	$533,661	$0	$0	$0	$533,661
Hoofbeat	Blaney Rd S	SH 94	$1,134,276	$0	$0	$0	$1,134,276
Soap Weed Rd	South of US 24	Beg. of paving	$1,027,281	$0	$0	$0	$1,027,281
Subtotal, Rural Road Paving			$16,349,850	$0	-$921,505	-$1,904,760	$13,523,585
Subtotal, County Road Improvements			$240,824,402	$3,677,885	-$1,977,490	-$16,207,367	$224,994,498
SH 94	City Limits	Slocum Rd	$14,195,844	$1,081,775	$0	$0	$15,277,619
US 83	Shoup Rd	Northgate Rd	$6,122,587	$713,090	$0	-$1,982,346	$4,853,331
US 24	31st St	Manitou Interchg	$2,456,484	$0	-$614,121	-$1,842,363	$0
US 24	Marksheffel	Constitution	$4,721,343	$484,120	$0	-$936,983	$4,268,480
US 24	Garrett Rd	Woodmen Rd	$8,610,812	$1,076,180	$0	-$774,959	$8,912,033
US 83	Northgate	Hodgen Rd	$6,040,686	$579,065	$0	-$728,173	$5,891,578
Subtotal, State Roads			$42,147,756	$3,934,230	-$614,121	-$6,264,824	$39,203,041
Total, All Improvements			$282,972,158	$7,612,115	-$2,591,611	-$22,472,191	$264,197,539

* segment cost based on estimated cost from 2016 Major Transportation Corridors Plan

Source: Segment cost based on segment length from Table 20 and cost per foot from Table 18; intersection and signal cost is number of needed intersection legs times cost per leg from Table 19 plus number of signals from Table 21 times cost per signal from Table 4; pass-through and deficiency costs are based on total project cost (sum of segment and intersection/signal costs) and deficiency and pass-through percentages from Table 22.

Table 23. Planned Signals

SH 94 at Curtis Road
SH 94 at Enoch Road
US 83 at Shoup Road
US 83 at Hodgen Road
US 24 at Falcon Highway

Table 24. Outstanding Pre-Ordinance Credits

Credit Holder/Area	Remaining Credits
Central Marksheffel	$2,654,742
Lorson Ranch	$2,626,512
Meridian Service	$175,317
Sand Creek Investments	$2,956,601
Eastbrook	$142,744
4 Way Ranch	$102,508
Journey Homes C S, LLC	$426
Campbell Homes	$34,704
Total	$8,693,554

Source: Reimbursement credits outstanding as of September 27, 2016 from El Paso County Public Services Department, October 11, 2016