



# WASHOE COUNTY

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## STAFF REPORT

BOARD MEETING DATE: January 13, 2015

**DATE:** December 19, 2014  
**TO:** Board of County Commissioners  
**FROM:** Clara Lawson, P.E., PTOE, Licensed Engineer  
Community Services Department, 328-3603, [clawson@washoecounty.us](mailto:clawson@washoecounty.us)  
**THROUGH:** Dwayne Smith, P.E., Division Director, Engineering and Capital Projects,  
Community Services Department, 328-2043, [desmith@washoecounty.us](mailto:desmith@washoecounty.us)  
**SUBJECT:** Introduction and first reading of an ordinance to adopt regional road impact fees for unincorporated Washoe County, as described in the Regional Road Capital Improvement Plan and Impact Fee Methodology dated September 19, 2014, and as provided for in NRS 278B.160 and Washoe County Code Section 110.706.05; and, providing for matters properly related thereto; and if introduced, set a public hearing for second reading and possible adoption of the ordinance for January 27, 2015 at 6:00 p.m. (All Commission Districts.)

### SUMMARY

The purpose of the agenda item is to introduce and hold a first reading of an ordinance to adopt regional road impact fees for unincorporated Washoe County and to set the second reading and possible adoption of the ordinance for January 27, 2015 at 6:00 p.m. Under NRS 237.060, a business impact statement is not required when impact fees are imposed pursuant to Chapter 278B of the NRS.

Washoe County Strategic Objective supported by this item: Sustainability of our financial, social and natural resources.

### PREVIOUS ACTION

On October 28, 2014, the Board of County Commissioners (Board) approved an Interlocal Agreement Regarding Regional Road Impact Fees Pursuant to NRS Chapter 277 and Chapter 278B between Washoe County, the Cities of Reno and Sparks and the Regional Transportation Commission (RTC) for the continuation of the Regional Road Impact Fee Program.

On November 12, 2014, the Board adopted a resolution authorizing the initiation of amendments to the Development Code, Chapter 110 of County Code, at Article 706, Impact Fees.

On November 12, 2014, the Board adopted a resolution establishing the Washoe County Planning Commission as the Washoe County Capital Improvements Advisory Committee for the Regional Road Impact Fee Program as authorized within NRS 278B.150.

AGENDA ITEM # 15

On November 13, 2014, the Planning Commission acknowledged receipt of the “Regional Road Impact Fee Program, 5<sup>th</sup> Edition Update”.

On January 6, 2015, the Capital Improvements Advisory Committee affirmed that the Regional Road Impact Fee Land Use Assumptions are in conformance with the Washoe County Master Plan, and reviewed the Regional Road Capital Improvements Plan and provided comments to be presented to the Board.

On January 6, 2015, the Planning Commission adopted a resolution and recommended approval of proposed amendments to Washoe County Code, Chapter 110, at Article 706, Impact Fees (DCA 14-013).

## **BACKGROUND**

The Regional Road Impact Fee (RRIF) was created as a funding mechanism for roadway capacity improvement projects which are directly related to new development. Nevada Revised Statutes (NRS) 278B allows the imposition of such a fee. An impact fee is defined as a charge imposed by a local government on new development to finance the costs of a capital improvement or facility expansion necessitated by and attributable to the new development. The RRIF has been in effect since February 1996.

In accordance with the provisions of the Interlocal Cooperative Agreement entered into by the RTC, Washoe County, the City of Reno, and the City of Sparks, the RTC is responsible for initiating periodic reviews of the RRIF program and proposing modifications to the participating governments. The review process is undertaken by the RTC in conjunction with the RRIF Technical Advisory Committee (RRIF TAC), which includes local government technical experts, development representatives from the private sector, and members of the local planning commissions.

The RTC retained TischlerBise to perform an overview of the RRIF program and make recommendations for improvements in order to meet state law impact fee requirements, national case law standards, and current best professional practices.

The proposed revision to the Capital Improvement Plan (CIP) incorporates the recommendations from the RRIF Program Overview Report prepared by TischlerBise, along with input from the RRIF TAC.

The RTC Board approved the modifications to the RRIF General Administrative Manual (GAM) and CIP on September 19, 2014. Land use assumptions are presented to the respective Planning Commissions of the Cities of Reno and Sparks and Washoe County for review and to determine conformance to each jurisdiction’s master plan. The land use assumptions are subsequently presented to the respective elected boards of the Cities of Reno and Sparks and Washoe County for approval. Ordinances approving the CIP are presented to the respective elected boards of the Cities of Reno and Sparks and Washoe County for approval. Resolutions approving the GAM are also presented to elected boards of the Cities of Reno and Sparks and Washoe County for approval.

Pursuant to NRS 278B.160, the Board must impose any impact fee by ordinance. Washoe County Code Section 110.706.05(e) requires that the Board adopt the impact fees associated with the Regional Road Improvement Fee Capital Improvement Plan (RRIF CIP, see Exhibit A to the attached ordinance) by ordinance. That ordinance is the subject of this staff report and of the recommended action by the Board.

### **FISCAL IMPACT**

There is no fiscal impact associated with this item.

### **RECOMMENDATION**

It is recommended the Board of County Commissioners hold an introduction and first reading of an ordinance to adopt regional road impact fees for unincorporated Washoe County, as described in the Regional Road Capital Improvement Plan and Impact Fee Methodology dated September 19, 2014, and as provided for in NRS 278B.160 and Washoe County Code Section 110.706.05; and, providing for matters properly related thereto; and if introduced, set a public hearing for second reading and possible adoption of the ordinance for January 27, 2015 at 6:00 p.m.

### **POSSIBLE MOTION**

Should the Board agree with the recommendation, a possible motion would be: "Move to hold an introduction and first reading of an ordinance to adopt regional road impact fees for unincorporated Washoe County, as described in the Regional Road Capital Improvement Plan and Impact Fee Methodology dated September 19, 2014, and as provided for in NRS 278B.160 and Washoe County Code Section 110.706.05; and, providing for matters properly related thereto; and if introduced, set a public hearing for second reading and possible adoption of the ordinance for January 27, 2015 at 6:00 p.m."

REGULAR TEXT: NO CHANGE IN LANGUAGE

~~STRIKEOUT TEXT: DELETED LANGUAGE~~

**BOLD TEXT: NEW LANGUAGE**

\*\*\*\*\*

Notice: Per NRS 239B.030, this document does not contain personal information as defined in NRS 603A.040

**Summary: To adopt Regional Road Impact Fees pursuant to NRS 278B.160 and Washoe County Code Section 110.706.05.**

BILL NO. \_\_\_\_\_

ORDINANCE NO. \_\_\_\_\_

An ordinance adopting regional road impact fees for unincorporated Washoe County, as described in the Regional Road Capital Improvement Plan and Impact Fee Methodology dated September 19, 2014, and as provided for in NRS 278B.160 and Washoe County Code Section 110.706.05; and, providing for matters properly related thereto.

WHEREAS:

- A. Following the notice and public hearing requirements set forth in Washoe County Code Chapter 110, Article 818; and
- B. This ordinance is adopted pursuant to a provision in NRS Chapter 278 and therefore is not a "rule" as defined in NRS 237.060 and does not require a business impact statement.

THE BOARD OF COUNTY COMMISSIONERS OF WASHOE COUNTY DOES HEREBY ORDAIN:

SECTION 1. The Regional Road Capital Improvement Plan and Impact Fee Methodology dated September 19, 2014 and attached hereto as Exhibit A, is hereby adopted to impose regional road impact fees within the unincorporated portions of Washoe County as contained in Exhibit A and as authorized pursuant to NRS 278B.160 and Washoe County Code Section 110.706.05.

SECTION 2. General Terms.

1. All actions, proceedings, matters and things heretofore taken, had and done by the County and its officers not inconsistent with the provisions of this Ordinance are ratified and approved.
2. The Chairman of the Board and the officers of the County are authorized and directed to take all action necessary or appropriate to effectuate the provisions of this ordinance. The District Attorney is authorized to make non-substantive edits and corrections to this Ordinance.
3. All ordinances, resolutions, bylaws and orders, or parts thereof, in conflict with the provisions of this ordinance are hereby repealed to the extent only of such inconsistency. This repealer shall not be construed to revive any ordinance, resolution, bylaw or order, or part thereof, heretofore repealed.
4. Each term and provision of this ordinance shall be valid and shall be enforced to the extent permitted by law. If any term or provision of this ordinance or the application thereof shall be deemed by a court of competent jurisdiction to be in violation of law or public policy, then it shall be deemed modified, ipso facto, to bring it within the limits of validity or enforceability, but if it cannot be so modified, then it shall be excised from this ordinance. In any event, the remainder of this ordinance, or the application of such term or provision to circumstances other than those to which it is invalid or unenforceable, shall not be affected.

PASSAGE AND EFFECTIVE DATE

This ordinance was proposed on \_\_\_\_\_ by Commissioner \_\_\_\_\_.

This ordinance was passed on \_\_\_\_\_.

Those voting "aye" were \_\_\_\_\_.

Those voting "nay" were \_\_\_\_\_.

Those absent were \_\_\_\_\_.

Those abstaining were \_\_\_\_\_.

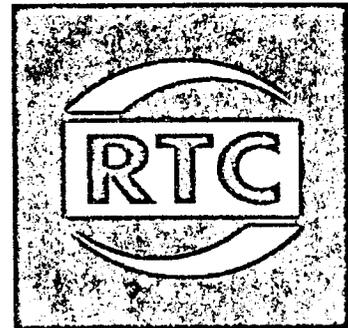
This ordinance shall be published and shall be in force and effect immediately upon the date of the second publication as set forth in NRS 244.100.

\_\_\_\_\_  
Chairman  
Washoe County Commission

ATTEST:

\_\_\_\_\_  
Nancy Parent, County Clerk

***Regional Road  
Capital Improvements Plan and  
Impact Fee Methodology***



***Regional Transportation Commission  
Washoe County/Reno/Sparks, Nevada***

August 28, 2014

*Prepared by:*

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9/19/14

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## EXECUTIVE SUMMARY

The Regional Transportation Commission (RTC) retained TischlerBise to update Regional Road Impact Fees (RRIF). RTC worked with the local governments of Reno, Sparks and Washoe County to prepare the supporting documentation for impact fees. Consistent with state law, impact fees are intended to pay the cost of constructing capital improvements or facility expansion necessitated by and attributable to new development. These growth-related projects are often referred to as “system improvements.” In contrast to project-level improvements, such as turn lanes for ingress/egress, impact fees fund growth-related infrastructure that will benefit multiple developments, or even the entire service area.

### Report Organization

This report uses a “drill-down” layout that presents general information first, followed by the underlying details. All readers will want to know the bottom-line, which is presented in the Executive Summary. If you want to know more detailed information, the middle section of the report discusses each factor used to derive impact fees for regional roads. The final section in this document provides supplemental documentation on land use assumptions (see Appendix A).

### Highlights of Nevada’s Impact Fee Enabling Legislation

Authority for impact fees in Nevada is provided in Chapter 278B of the Nevada Revised Statutes. The enabling legislation sets forth procedures and requirements for implementation of impact fees in Nevada. According to NRS 278B.160, eligible costs include:

- Estimated cost of actual construction;
- Estimated cost to acquire land; and
- Fees paid for professional services, such as engineering and preparation of the capital improvements plan, in anticipation of the imposition of an impact fee.

Before impact fees are adopted, the local government must develop and adopt a capital improvements plan (CIP) that includes those improvements for which fees were developed. The required CIP is contained in the middle section of this document. As specified in NRS 278B.130, street project means arterial or collector streets or roads designated in the master plan adopted by the local government, including all appurtenances, traffic signals and incidentals necessary for any such facilities.

Nevada allows property owners to request a refund of impact fees if construction of system improvements does not begin within five years of collection. Also, property owners may request a refund of any fee balance that has not been spent within ten years of collection. Because the CIP and impact fees are required to be updated at least every three years, impact fee calculations are in current dollars (not inflated over time). The Nevada Act also requires a Capital Improvements Advisory Committee to review land use assumptions and growth-related projects that will receive impact fee funding. The local planning commissions serve as the mandatory advisory group for the RRIF Program.

## Proposed Impact Fee Schedules

Proposed 2014 fees by type of development are summarized in Figures 1 and 2, including fees for the north and south service areas, respectively. The 2014 RRIF analysis combines geographic areas previously known as the Northeast and Northwest Benefit Districts, into a single North Service Area. Current fees within the City of Reno (approved in 2010) are also shown, along with the dollar and percentage change between the proposed and current fees. Red numbers in the dollar change column indicate proposed reductions in the RRIF for all types of development.

**Figure 1 – Current and Proposed Regional Road Impact Fees in North Service Area**

<b>Input Variables</b>						
	Average Miles per Trip		2.87			
	RRIF Share of CIP		\$65,394,800			
	VMT Increase Over Ten Years		258,081			
	Capital Cost per VMT		\$253.39			
<b>ITE Code</b>	<b>Development Type</b>	<b>Development Unit</b>	<b>Proposed 2014 RRIF</b>	<b>2010 RRIF (rounded)</b>	<b>\$ Change</b>	<b>% Change</b>
<b>Residential</b>						
210	Single Unit	Dwelling	\$3,784	\$4,177	(\$393)	-9%
220	2+ Units per Structure	Dwelling	\$2,457	\$2,845	(\$388)	-14%
<b>Industrial</b>						
110	Light Industrial	1000 Sq Ft	\$1,850	\$2,534	(\$684)	-27%
140	Manufacturing	1000 Sq Ft	\$1,013	\$1,379	(\$366)	-27%
150	Warehouse	1000 Sq Ft	\$944	\$1,799	(\$855)	-48%
151	Mini-Warehouse	1000 Sq Ft	\$663	\$964	(\$301)	-31%
<b>Commercial</b>						
820	Retail and Eating/Drinking Places	1000 Sq Ft Leasable	\$6,763	\$8,681	(\$1,918)	-22%
RTC	Casino Gaming Area	1000 Sq Ft	\$12,223	\$16,699	(\$4,476)	-27%
<b>Office &amp; Other Services</b>						
320	Lodging	Room	\$1,494	\$3,291	(\$1,797)	-55%
412	Regional Park	Acre	\$605	\$653	(\$48)	-7%
520	Schools and Daycare	1000 Sq Ft	\$2,703			
610	Hospital	1000 Sq Ft	\$3,509	\$6,201	(\$2,692)	-43%
620	Nursing Home	1000 Sq Ft	\$2,017	\$2,054	(\$37)	-2%
710	Office and Other Services	1000 Sq Ft	\$2,927	\$3,991	(\$1,064)	-27%
720	Medical Office	1000 Sq Ft	\$9,590	\$11,970	(\$2,380)	-20%

In the South Service Area, previously called the South Benefit District, the proposed 2014 fees decrease for all development types except single unit residential, regional park, and nursing home. These development types will have a slight increase ranging from one to nine percent.

**Figure 2 – Current and Proposed Regional Road Impact Fees in South Service Area**

**Input Variables**

Average Miles per Trip		2.82				
RRIF Share of CIP		\$100,474,800				
VMT Increase Over Ten Years		350,027				
Capital Cost per VMT		\$287.05				
ITE Code	Development Type	Development Unit	Proposed 2014 RRIF	2010 RRIF (rounded)	\$ Change	% Change
<b>Residential</b>						
210	Single Unit	Dwelling	\$4,212	\$4,177	\$35	1%
220	2+ Units per Structure	Dwelling	\$2,735	\$2,845	(\$110)	-4%
<b>Industrial</b>						
110	Light Industrial	1000 Sq Ft	\$2,059	\$2,534	(\$475)	-19%
140	Manufacturing	1000 Sq Ft	\$1,128	\$1,379	(\$251)	-18%
150	Warehouse	1000 Sq Ft	\$1,051	\$1,799	(\$748)	-42%
151	Mini-Warehouse	1000 Sq Ft	\$738	\$964	(\$226)	-23%
<b>Commercial</b>						
820	Retail and Eating/Drinking Places	1000 Sq Ft Leasable	\$7,528	\$8,681	(\$1,153)	-13%
RTC	Casino Gaming Area	1000 Sq Ft	\$13,605	\$16,699	(\$3,094)	-19%
<b>Office &amp; Other Services</b>						
320	Lodging	Room	\$1,663	\$3,291	(\$1,628)	-49%
412	Regional Park	Acre	\$673	\$653	\$20	3%
520	Schools and Daycare	1000 Sq Ft	\$3,008			
610	Hospital	1000 Sq Ft	\$3,905	\$6,201	(\$2,296)	-37%
620	Nursing Home	1000 Sq Ft	\$2,245	\$2,054	\$191	9%
710	Office and Other Services	1000 Sq Ft	\$3,258	\$3,991	(\$733)	-18%
720	Medical Office	1000 Sq Ft	\$10,674	\$11,970	(\$1,296)	-11%



## CIP AND IMPACT FEE METHODOLOGY

This section of the methodology report includes the seven components of the capital improvements plan, as specified in NRS 278B.170. In simple terms, the growth-related cost of regional road improvements was allocated to the projected increase in development over the next ten years to yield the proposed impact fees.

### General Legal Framework

Both state and federal courts have recognized the imposition of impact fees on development as a legitimate form of land use regulation, provided the fees meet standards intended to protect against regulatory takings. Land use regulations, development exactions, and impact fees are subject to the Fifth Amendment prohibition on taking of private property for public use without just compensation. To comply with the Fifth Amendment, development regulations must be shown to substantially advance a legitimate governmental interest. In the case of impact fees, that interest is in the protection of public health, safety, and welfare by ensuring that development is not detrimental to the quality of essential public services. The means to this end are also important, requiring both procedural and substantive due process. The process followed to receive community input, with open Advisory Committee meetings, work sessions and public hearings with elected officials, provided opportunity for comments and refinements to the impact fees.

There is little federal case law specifically dealing with impact fees, although other rulings on other types of exactions (e.g., land dedication requirements) are relevant. In one of the most important exaction cases, the U. S. Supreme Court found that a government agency imposing exactions on development must demonstrate an “essential nexus” between the exaction and the interest being protected (see *Nollan v. California Coastal Commission*, 1987). In a more recent case (*Dolan v. City of Tigard, OR*, 1994), the Court ruled that an exaction also must be “roughly proportional” to the burden created by development. However, the *Dolan* decision appeared to set a higher standard of review for mandatory dedications of land than for monetary exactions such as development impact fees. These standards have not been conclusively litigated in Nevada in the context of impact fees, nor has “roughly proportional” been defined as an acceptable range of value.

There are three reasonable relationship requirements for development impact fees that are closely related to “rational nexus” or “reasonable relationship” requirements enunciated by a number of state courts. Although the term “dual rational nexus” is often used to characterize the standard by which courts evaluate the validity of development impact fees under the U.S. Constitution, we prefer a more rigorous formulation that recognizes three elements: “need,” “benefit,” and “proportionality.” The dual rational nexus test explicitly addresses only the first two, although proportionality is reasonably implied, and was specifically mentioned by the U.S. Supreme Court in the *Dolan* case. The reasonable relationship standard of the Nevada statute is considered less strict than the rational nexus standard used by many courts. Individual elements of the nexus standard are discussed further in the following paragraphs.

All new development in a community creates additional demands on some, or all, public facilities provided by local government. If the capacity of facilities is not increased to satisfy that additional demand, the quality or availability of public services for the entire community will deteriorate. Development impact fees may be used to recover the cost of development-related facilities, but only to the extent that the need for facilities is a consequence of development that is subject to the fees. The *Nollan* decision reinforced the principle that development exactions may be used only to mitigate conditions created by the developments upon which they are imposed. That principle clearly applies to

impact fees. In this study, the impact of development on improvement needs is analyzed in terms of quantifiable relationships between various types of development and the demand for specific facilities, based on applicable level-of-service standards.

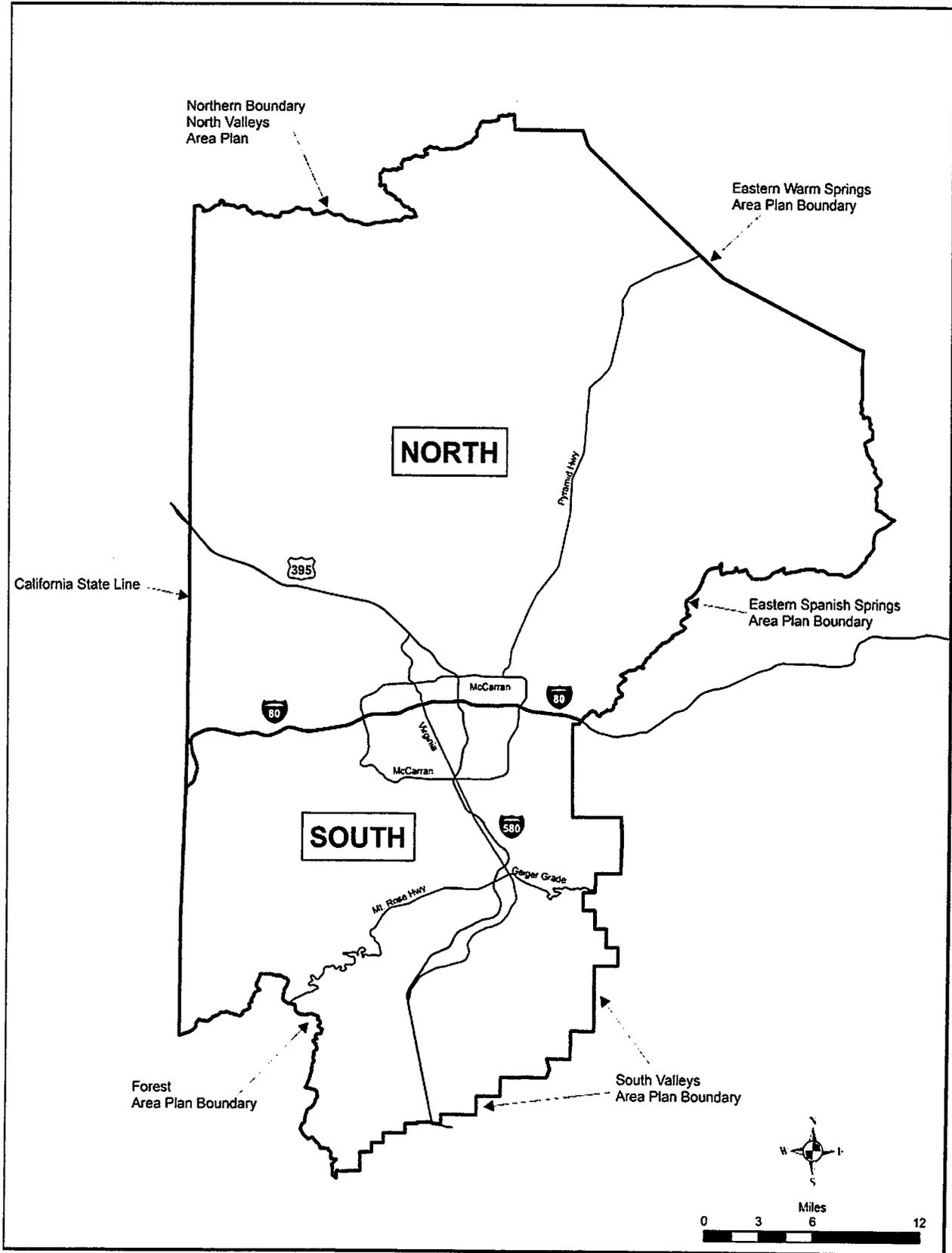
The requirement that exactions be proportional to the impacts of development was clearly stated by the U.S. Supreme Court in the *Dolan* case (although the relevance of that decision to impact fees has been debated) and is logically necessary to establish a proper nexus. Proportionality is established through the procedures used to identify development-related facility costs, and in the methods used to calculate impact fees for various types of facilities and categories of development. The demand for facilities is measured in terms of relevant and measurable attributes of development (e.g. a typical housing unit's average weekday vehicle trips).

A sufficient benefit relationship requires that impact fee revenues be segregated from other funds and expended only on the facilities for which the fees were charged. Impact fees must be expended in a timely manner and the facilities funded by the fees must serve the development paying the fees. However, nothing in the U.S. Constitution or the state enabling legislation requires that facilities funded with fee revenues be available *exclusively* to development paying the fees. In other words, benefit may extend to a general area including multiple real estate developments. Procedures for the earmarking and expenditure of fee revenues are mandated in state enabling legislation, as discussed further below. All of these procedural as well as substantive issues are intended to ensure that new development benefits from the impact fees they are required to pay. The authority and procedures to implement impact fees is separate from and complementary to the authority to require improvements as part of subdivision or zoning review.

### **RRIF Service Areas**

As shown in Figure 3, the CIP and impact fees for regional roads combines the Northeast and Northwest Benefit Districts, used in the 2010 RRIF study, to form a single North Service Area. The proposed South Service Area is essentially the same as the previous South Benefit District. The service areas are defined by Washoe County Planning Area boundaries. Traffic analysis zones used in the long-range transportation model were the basis for the calculations used to develop the impact fees.

Figure 3 – Proposed Service Areas



## Existing Infrastructure, Level of Usage, and Capacity Analysis

Regional road impact fees rely on RTC's extensive and ongoing transportation planning effort. RTC maintains an extensive database of all arterial and collector streets, including segment lengths and number of lanes. For the purpose of impact fees, RTC identified a regional road network that excludes limited access highways like Interstate 80 and all local streets. Also, the regional road network excludes collectors that carry less than 14,000 annualized average daily trips. Unless already identified in the CIP, a new road constructed by a private developer will not be added to the regional network until the first two lanes are built and the road meets the minimum traffic volume threshold.

As the designated Metropolitan Planning Organization (MPO) for the urbanized area of Reno, Sparks, and Washoe County, RTC analyzed the current and projected use of the regional road network to identify the need for capacity expansion, based on the approved land use assumptions. The recommended capital improvements, by service area, are necessitated by and attributable to new development.

### Excluded Costs

The regional road impact fees exclude costs to upgrade, update, improve, expand, correct or replace streets to meet existing needs or more stringent safety, environmental or regulatory standards. These excluded costs will be addressed using funding sources other than impact fees.

### Trip Generation Rates

Regional road impact fees are derived using average weekday vehicle trip ends (VTE). Trip generation rates are from the reference book Trip Generation published by the Institute of Transportation Engineers (ITE 2012). A VTE represents a vehicle either entering or exiting a development (as if a traffic counter were placed across a driveway). To calculate street fees, trip generation rates require an adjustment factor to avoid double counting each trip at both the origin and destination points. Therefore, the basic trip adjustment factor is 50%. As discussed further below, the RRIF methodology includes additional adjustments to make the fees proportionate to the infrastructure demand for particular types of development.

### Average Trip Length

In addition to trip generation, the VMT analysis requires an average trip length, measured in miles. A typical vehicle trip, such as a person leaving their home and traveling to work, generally begins on a local street that connects to a collector street, which connects to an arterial road and eventually to a state or interstate highway. This progression of travel up and down the functional classification chain limits the average trip length determination, for the purpose of development fees, to the following question, "What is the average vehicle trip length on the regional road network?" RTC answered this question using a computerized transportation model and the technical expertise of a transportation consultant. The north service area has an average trip length on the regional road network of 2.87 miles, with a slightly shorter distance of 2.82 miles in the south service area.

### Forecast of Service Units

Regional road impact fees use average weekday Vehicle Miles of Travel (VMT) as the service units for allocating the cost of future improvements. TischlerBise created an aggregate travel model to convert development units within the north and south service areas to vehicle trips and vehicle miles of travel.

Projected development units are consistent with the master plans of Reno, Sparks, and Washoe County, as documented in the land use assumptions (see Appendix A).

Figures 4 and 5 summarize the input variables for the travel model, by service area. Trip generation rates, expressed as average weekday Vehicle Trip Ends (VTE), are from the Institute of Transportation Engineers (ITE). DU is an abbreviation for dwelling unit. Additional documentation of demographic data, such as housing mix and average number of persons per housing unit (abbreviated PPHU), is contained in the land use assumptions at the end of this report. KSF is an abbreviation for square feet of nonresidential floor area, expressed in thousands.

Each input variable, such as the trip rate and length adjustments, is further described in the following sections. Also shown in the two columns on the right are vehicle miles of travel for each of the development prototypes, indicating a decrease in travel demand over time. The 2014 column indicates updated data and the 2010 column lists data from the previous methodology report.

**Figure 4 – North Service Area Travel Model Inputs**

<b>North Service Area</b>	<b>ITE Code</b>	<b>Dev Type</b>	<b>Weekday Veh Trip Ends</b>	<b>Dev Unit</b>	<b>Trip Adj</b>	<b>Trip Length Wt Factor</b>	<b>2014 VMT per Dev Unit</b>	<b>2010 VMT per Dev Unit</b>
R1 =>	210	Single Units	8.27	DU	52%	121%	14.93	19.32
R2 =>	220	2+ Units	5.37	DU	52%	121%	9.70	13.16
NR1 =>	150	Industrial	3.56	KSF	50%	73%	3.73	8.32
NR2 =>	820	Commercial	42.70	KSF	33%	66%	26.69	40.15
NR3 =>	710	All Other Services	11.03	KSF	50%	73%	11.55	18.46
<b>Avg Trip Length (miles)</b>	<b>2.87</b>	<b>Countywide Single</b>	<b>72%</b>					
<b>Countywide PPHU</b>	<b>2.28</b>	<b>Countywide 2+ Units</b>	<b>28%</b>					

With a slightly shorter average trip length in the south service area, expected travel demand (i.e. VMT) per development unit is also less, as shown in Figure 5.

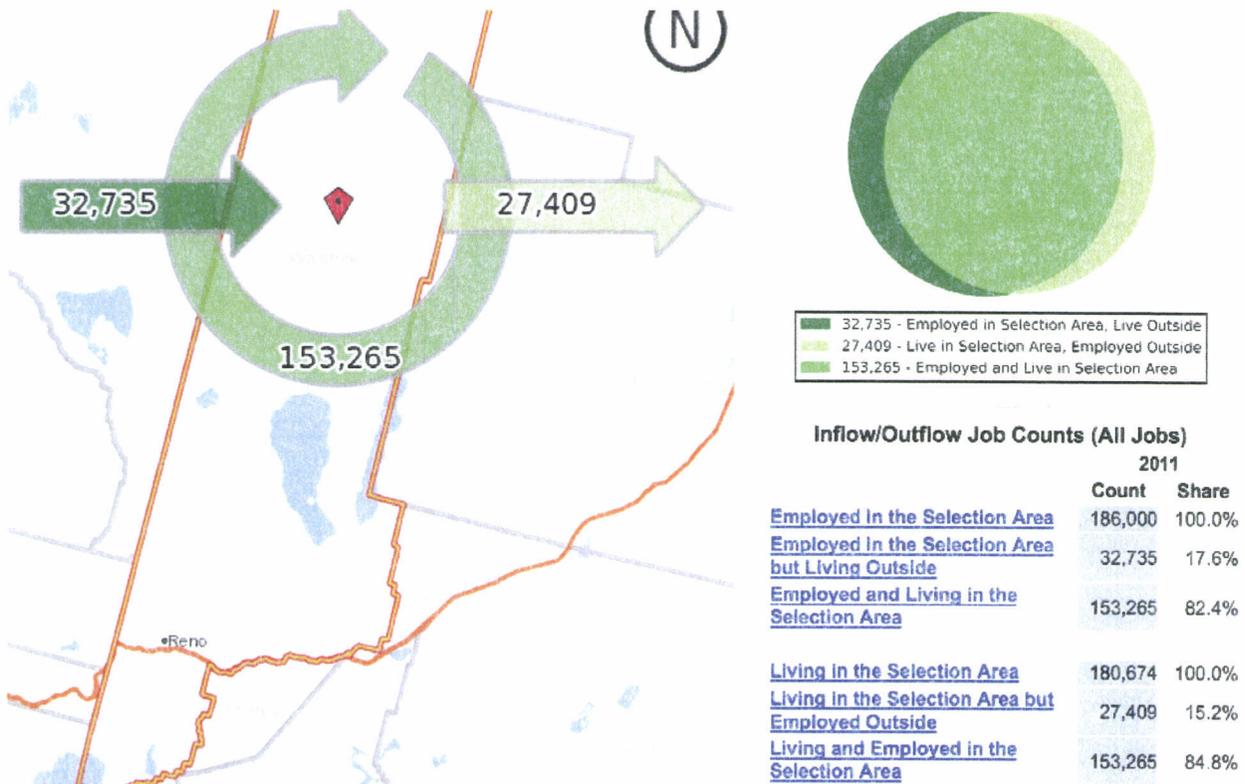
**Figure 5 – South Service Area Travel Model Inputs**

<b>South Service Area</b>	<b>ITE Code</b>	<b>Dev Type</b>	<b>Weekday Veh Trip Ends</b>	<b>Dev Unit</b>	<b>Trip Adj</b>	<b>Trip Length Wt Factor</b>	<b>2014 VMT per Dev Unit</b>	<b>2010 VMT per Dev Unit</b>
R1 =>	210	Single Units	8.27	DU	52%	121%	14.67	19.32
R2 =>	220	2+ Units	5.37	DU	52%	121%	9.53	13.16
NR1 =>	150	Industrial	3.56	KSF	50%	73%	3.66	8.32
NR2 =>	820	Commercial	42.70	KSF	33%	66%	26.23	40.15
NR3 =>	710	All Other Services	11.03	KSF	50%	73%	11.35	18.46
<b>Avg Trip Length (miles)</b>	<b>2.82</b>	<b>Countywide Single</b>	<b>72%</b>					
<b>Countywide PPHU</b>	<b>2.28</b>	<b>Countywide 2+ Units</b>	<b>28%</b>					

## Adjustments for Commuting Patterns and Pass-By Trips

Residential development has a larger trip adjustment factor of 52% to account for commuters leaving Washoe County for work. In other words, residential development is assigned all inbound trips plus 15% of outbound trips to account for job locations outside of Washoe County, calculated as follows. According to the 2009 National Household Travel Survey (see Table 30) weekday work trips are typically 31% of production trips (i.e., all out-bound trips). As shown in Figure 6, the Census Bureau’s web application OnTheMap indicates that approximately 15% of resident workers traveled outside the county for work in 2011. In combination, these factors (0.31 x 0.50 x 0.15 = 0.02) support the additional 2% allocation of trips to residential development.

Figure 6 - Inflow/Outflow Analysis



For commercial development, the trip adjustment factor is less than 50% because retail development attracts vehicles as they pass by on arterial and collector roads. For example, when someone stops at a convenience store on the way home from work, the convenience store is not the primary destination. For an average shopping center, ITE data indicate 34% of the vehicles that enter are passing by on their way to some other primary destination. The remaining 66% of attraction trips have the commercial site as their primary destination. Because attraction trips are half of all trips, the trip adjustment factor is 66% multiplied by 50%, or approximately 33% of the trip ends.

Many institutional land uses, like schools, also have significant pass-by and diverted link trips as children are dropped off and picked up by parents on their way to some other primary destination. Given this travel pattern, TischlerBise utilized the pass-by adjustment in the RRIF calculations for schools and daycare.

### Trip Length Weighting Factors by Type of Land Use

The RRIF methodology includes a percentage adjustment, or weighting factor, to account for trip length variation by type of land use. As documented in Table 6 of the 2009 National Household Travel Survey, vehicle trips from residential development are approximately 121% of the average trip length. The residential trip length adjustment factor includes data on home-based work trips, social, and recreational purposes. Conversely, shopping trips associated with commercial development are roughly 66% of the average trip length while other nonresidential development typically accounts for trips that are 73% of the average for all trips.

## Projected Vehicle Miles of Travel

At the bottom of Figures 7 and 8 are projections of VMT over 10 years in the north and south service areas, respectively. In the aggregate, VMT is the product of vehicle trips multiplied by the average trip length<sup>1</sup>. Vehicle trips are shown in the middle of the table below (see area with blue shading) and average trip length, by service area, was discussed above. The RRIF share for multi-modal improvements is based on the projected increase in VMT from 2014 to 2024. In the north, VMT increases by 14% over the next ten years.

**Figure 7 – North Travel Demand**

<b>North Service Area</b>	<b>2010</b>	<b>2014</b>	<b>2024</b>	<b>2025</b>	<b>2014-2024 Increase</b>
<b>Total Population</b>	250,666	<b>261,910</b>	<b>292,277</b>	295,501	<b>30,367</b>
<b>Total Housing Units</b>	<b>109,941</b>	<b>114,873</b>	<b>128,192</b>	<b>129,606</b>	<b>13,319</b>
<b>Single Housing Units</b>	<b>79,158</b>	82,709	92,298	<b>93,316</b>	<b>9,589</b>
<b>2+ Housing Units</b>	<b>30,783</b>	32,164	35,894	<b>36,290</b>	<b>3,730</b>
<b>Industrial Jobs</b>	9,938	<b>11,034</b>	<b>14,334</b>	14,714	<b>3,300</b>
<b>Commercial Jobs</b>	11,793	<b>12,659</b>	<b>15,113</b>	15,383	<b>2,454</b>
<b>All Other Services Jobs</b>	38,661	<b>41,906</b>	<b>51,262</b>	52,305	<b>9,355</b>
<b>Total Jobs</b>	<b>60,392</b>	<b>65,600</b>	<b>80,708</b>	<b>82,402</b>	<b>15,109</b>
<b>Industrial KSF</b>	<b>10,862</b>	12,061	15,667	<b>16,082</b>	<b>3,606</b>
<b>Commercial KSF</b>	<b>5,897</b>	6,330	7,556	<b>7,692</b>	<b>1,226</b>
<b>All Other Services KSF</b>	<b>11,637</b>	12,614	15,430	<b>15,744</b>	<b>2,816</b>
<i>Single Unit Trips</i>	340,411	355,682	396,918	401,296	<b>41,237</b>
<i>2+ Units Trips</i>	85,958	89,815	100,230	101,336	<b>10,416</b>
<i>Industrial Trips</i>	19,334	21,469	27,887	28,626	<b>6,419</b>
<i>Commercial Trips</i>	83,095	89,196	106,472	108,388	<b>17,276</b>
<i>All Other Services Trips</i>	64,178	69,566	85,096	86,828	<b>15,530</b>
<b>Total Vehicle Trips</b>	<b>592,977</b>	<b>625,727</b>	<b>716,604</b>	<b>726,474</b>	<b>90,877</b>
<b>Weekday Vehicle Miles of Travel (VMT)</b>	1,813,018	1,906,758	2,164,839	2,192,688	<b>258,081</b>

<sup>1</sup> Typical VMT calculations for development-specific traffic studies, along with most transportation models of an entire urban area, are derived from traffic counts on particular road segments multiplied by the length of that road segment. For the purpose of impact fees, VMT calculations are based on attraction (inbound) trips to development located in the service area, with the trip lengths calibrated to the road network considered to be system improvements. This refinement eliminates pass-through or external-external trips, and travel on roads that are not system improvements (e.g. interstate highways).

Figure 8 indicates the increase in vehicle miles of travel due to additional development in the south service area. The RRIF share for multi-modal improvements is based on the projected increase in VMT from 2014 to 2024. In the south, VMT increases by 18% over the next ten years.

**Figure 8 – South Travel Demand**

<b>South Service Area</b>	<b>2010</b>	<b>2014</b>	<b>2024</b>	<b>2025</b>	<b>2014-2024 Increase</b>
<b>Total Population</b>	153,925	163,850	191,552	194,568	27,703
<b>Total Housing Units</b>	67,511	71,864	84,014	85,337	12,150
<b>Single Housing Units</b>	48,608	51,742	60,490	61,443	8,748
<b>2+ Housing Units</b>	18,903	20,122	23,524	23,894	3,402
<b>Industrial Jobs</b>	39,029	41,577	48,699	49,475	7,122
<b>Commercial Jobs</b>	33,177	35,667	42,740	43,520	7,073
<b>All Other Services Jobs</b>	99,090	106,136	126,022	128,205	19,886
<b>Total Jobs</b>	171,296	183,380	217,461	221,200	34,081
<b>Industrial KSF</b>	42,659	45,444	53,228	54,076	7,784
<b>Commercial KSF</b>	16,589	17,833	21,370	21,760	3,537
<b>All Other Services KSF</b>	29,826	31,947	37,933	38,590	5,986
<i>Single Unit Trips</i>	209,034	222,511	260,131	264,229	37,620
<i>2+ Units Trips</i>	52,785	56,189	65,688	66,722	9,500
<i>Industrial Trips</i>	75,933	80,890	94,746	96,255	13,856
<i>Commercial Trips</i>	233,756	251,285	301,125	306,620	49,840
<i>All Other Services Trips</i>	164,490	176,188	209,200	212,824	33,013
<b>Total Vehicle Trips</b>	735,998	787,063	930,891	946,650	143,828
<b>Weekday Vehicle Miles of Travel (VMT)</b>	1,823,379	1,947,892	2,297,919	2,336,223	350,027

### Capital Improvements Plan for Regional Roads

The need for regional road improvements is based on RTC’s transportation model and quantitative measures, like volume to capacity ratios. The recommended improvements are located in areas expected to experience congestion problems, like access points to Interstate 80. As traffic flows from larger travel sheds to the regional road network, congestion occurs much like a funnel that tapers to fit into a bottleneck.

As shown in Figure 9, CIP projects in the north service area are listed from the most to least expensive RRIF funding (see far right column). For each project in the CIP, the RRIF share is based on projected funding taking into account other available sources such as federal and state highway funds. At the bottom of the list is Pyramid Highway, which is a major growth-related improvement, yet this project is being fully funded by revenue sources other than impact fees. All projects with a RRIF share of 14% are complete street improvements that enhance multiple modes of travel, including walking, biking, and transit. The growth share for multi-modal improvements is based on the projected increase in VMT, as shown above (see Figure 7).

**Figure 9 – North Service Area Capital Improvements Plan**

#	Project Description	Extent	Estimated Cost (2014 dollars)	RRIF Share	RRIF Funding
1	Additional Ramps	TBD - (5 ramps)	\$50,000,000	50%	\$25,000,000
2	Sparks Blvd (4 to 6 lanes)	I-80 to Baring Blvd	\$10,906,100	100%	\$10,906,100
3	Additional Intersections	TBD - (5 intersections)	\$15,000,000	50%	\$7,500,000
4	Traffic Signals / ITS / Roundabouts	locations to be determined as needed (avg of \$500,000 per year)	\$14,060,800	36%	\$5,000,000
5	McCarran Blvd Intersection	@ N Virginia St	\$4,326,400	100%	\$4,326,400
6	4th St/Prater Way	I-80 to Vista Blvd	\$23,443,800	14%	\$3,282,100
7	Oddie Blvd/Wells Ave	Phase 1 US 395 to Pyramid Way	\$20,009,600	14%	\$2,801,300
8	La Posada Dr Roundabout	@ Cordoba Blvd	\$2,163,200	100%	\$2,163,200
9	Oddie Blvd/Wells Ave	Phase 2 I-80 to US 395	\$13,852,800	14%	\$1,939,400
10	Sun Valley Blvd	2nd Ave to Pyramid/Sun Valley/395 Connector	\$9,626,200	14%	\$1,347,700
11	Pedestrian & Bicycle Facilities within ROW	based on Bike/Ped Master Plan	\$5,408,000	14%	\$757,100
12	Sutro St	I-80 to McCarran Blvd	\$1,601,800	14%	\$224,300
13	Keystone Ave	I-80 to 7th St	\$1,051,500	14%	\$147,200
14	Pyramid Hwy	@ McCarran Blvd	\$71,385,600	0%	\$0
<b>TOTAL</b>			<b>\$242,835,800</b>	<b>27%</b>	<b>\$65,394,800</b>
Revenue from Sources Other Than RRIF =>				<b>73%</b>	<b>\$177,441,000</b>

As shown in Figure 10, CIP projects in the south service area are listed from the most to least expensive RRIF funding (see far right column). For each project in the CIP, the RRIF share is based on projected funding taking into account other available sources such as federal and state highway funds. At the bottom of the list are three major growth-related improvements that are being fully funded by revenue sources other than impact fees. All projects with a RRIF share of 18% are complete street improvements that enhance multiple modes of travel, including walking, biking, and transit. The growth share for multi-modal improvements is based on the projected increase in VMT in the south service area, as shown above (see Figure 8).

**Figure 10 – South Service Area Capital Improvements Plan**

#	Project Description	Extent	Estimated Cost (2014 dollars)	RRIF Share	RRIF Funding
1	Additional Ramps	TBD - (5 ramps)	\$50,000,000	50%	\$25,000,000
2	McCarran Blvd (4 to 6 lanes)	Mira Loma Dr to Greg St	\$16,224,000	100%	\$16,224,000
3	Mill St Extension (4 lanes)	McCarran Blvd to SE Connector	\$14,817,900	100%	\$14,817,900
4	Pembroke (2 to 4 lanes)	McCarran Blvd to SE Connector	\$15,381,000	50%	\$7,690,500
5	Additional Intersections	TBD - (5 intersections)	\$15,000,000	50%	\$7,500,000
6	Wells Ave	Mill St to Kuenzli Ln	\$12,000,000	50%	\$6,000,000
7	Traffic Signals / ITS / Roundabouts	locations to be determined as needed (avg of \$500,000 per year)	\$14,060,800	36%	\$5,000,000
8	Kietzke Ln	Virginia St to Galletti Way	\$22,497,300	18%	\$4,049,500
9	4th St/Prater Way	Keystone Ave to I-80	\$15,493,800	18%	\$2,788,900
10	Virginia St	Plumb Ln to Liberty St	\$12,979,200	18%	\$2,336,300
11	Sparks Blvd (4 to 6 lanes)	Greg St to I-80	\$2,181,200	100%	\$2,181,200
12	Mill St/Terminal Way	Airport to Lake St	\$9,193,600	18%	\$1,654,800
13	Damonte Ranch Pkwy Intersections	@ I-580, Double R Blvd, Virginia St	\$1,622,400	100%	\$1,622,400
14	Keystone Ave	California Ave to I-80	\$8,250,300	18%	\$1,485,100
15	Oddie Blvd/Wells Ave	(Phase 2 Kuenzli to I-80	\$6,156,800	18%	\$1,108,200
16	Pedestrian & Bicycle Facilities within ROW	based on Bike/Ped Master Plan	\$5,408,000	18%	\$973,400
17	Sutro St	4th St to I-80	\$236,900	18%	\$42,600
18	Geiger Grade (4 lanes)	Virginia St to Toll Rd	\$57,108,500	0%	\$0
19	Plumb Ln	McCarran Blvd to Ferris Ln	\$6,489,600	0%	\$0
20	SouthEast Connector (6 lanes)	South Meadows Pkwy to Greg St	\$228,866,600	0%	\$0
<b>TOTAL</b>			<b>\$513,967,900</b>	<b>20%</b>	<b>\$100,474,800</b>
Revenue from Sources Other Than RRIF =>				<b>80%</b>	<b>\$413,493,100</b>

## Credits

A consideration of “credits” is integral to the development of a legally defensible impact fee methodology. There are two types of “credits” with specific characteristics, which are addressed in the RRIF study. First, to avoid possible double payment for growth-related improvements from other funding sources, a revenue credit might be necessary. However, regional road impact fees are not based on the total cost of improvements but a conservative RRIF share that ranges from 20 to 27 percent. In other words, other funding sources, such as federal and state highway funds, are covering 73 to 80 percent of the capital cost.

The second type of credit is a site-specific credit or developer reimbursement for dedication of land or construction of system improvements (see NRS 278B.240). This type of credit is addressed in the administration and implementation of the impact fee program, as described in the RRIF General Administrative Manual.

### Impact Fees for Regional Roads

Input variables for the regional road impact fees in the north service area are shown in Figure 11. Given the RRIF share of the ten-year CIP in the north service area is \$65,394,800 and projected development adds 258,081 vehicle miles of travel over the next ten years, the capital cost is \$253.39 per VMT. To derive the impact fee for a single residential unit, multiply the following factors from Figure 11.

$$\begin{array}{r} 8.27 \text{ weekday vehicle trip ends per dwelling} \\ \times \\ 0.52 \text{ adjustment factor for inbound trips} \\ \times \\ 2.87 \text{ average miles per trip in north service area} \\ \times \\ 1.21 \text{ trip length adjustment factor for residential development} \\ \times \\ \$253.39 \text{ net capital cost per VMT} \\ = \\ \$3,784 \text{ per housing unit (truncated)} \end{array}$$

In comparison to the current fee schedule, the proposed fee schedule (shown below) is easier to administer. For example, the proposed fee schedule has consolidated categories and eliminated size thresholds for commercial development. At the bottom of Figure 11 are "Other Categories to be Discontinued" with the applicable development type and fee to be applied using the recommended 2014 fee schedule. Proposed 2014 fees are compared to the current fees (see column labeled 2010 RRIF), with both dollar and percent change indicated. In the north service area, proposed residential fees are 9 to 14 percent less than current fees and nonresidential fees decrease 2 to 55 percent.

Figure 11 – RRIF Schedule for North Service Area

**Input Variables**

Average Miles per Trip	2.87
RRIF Share of CIP	\$65,394,800
VMT Increase Over Ten Years	258,081
Capital Cost per VMT	\$253.39

RRIF Code	Development Type	Development Unit	Avg Wkly Veh Trip Ends	Trip Rate Adjustment	Trip Length Adjustment	Proposed 2014 RRIF	2010 RRIF (rounded)
<b>Residential</b>							
210	Single Unit	Dwelling	8.27	52%	121%	\$3,784	\$4,177
220	2+ Units per Structure	Dwelling	5.37	52%	121%	\$2,457	\$2,845
<b>Industrial</b>							
110	Light Industrial	1000 Sq Ft	6.97	50%	73%	\$1,850	\$2,534
140	Manufacturing	1000 Sq Ft	3.82	50%	73%	\$1,013	\$1,379
150	Warehouse	1000 Sq Ft	3.56	50%	73%	\$944	\$1,799
151	Mini-Warehouse	1000 Sq Ft	2.50	50%	73%	\$663	\$964
<b>Commercial</b>							
820	Retail and Eating/Drinking Places	1000 Sq Ft Leasable	42.70	33%	66%	\$6,763	\$8,681
RTC	Casino Gaming Area	1000 Sq Ft	46.05	50%	73%	\$12,223	\$16,699
<b>Office &amp; Other Services</b>							
320	Lodging	Room	5.63	50%	73%	\$1,494	\$3,291
412	Regional Park	Acre	2.28	50%	73%	\$605	\$653
520	Schools and Daycare	1000 Sq Ft	15.43	33%	73%	\$2,703	
610	Hospital	1000 Sq Ft	13.22	50%	73%	\$3,509	\$6,201
620	Nursing Home	1000 Sq Ft	7.60	50%	73%	\$2,017	\$2,054
710	Office and Other Services	1000 Sq Ft	11.03	50%	73%	\$2,927	\$3,991
720	Medical Office	1000 Sq Ft	36.13	50%	73%	\$9,590	\$11,970

Input variables for the regional road impact fees in the south service area are shown in Figure 12. Given the RRIF share of the ten-year CIP in the south service area is \$100,474,800 and projected development adds 350,027 vehicle miles of travel over the next ten years, the capital cost is \$287.05 per VMT. To derive the impact fee for nonresidential development, like a warehouse, multiply the following factors from Figure 12.

$$\begin{array}{r} 3.56 \text{ weekday vehicle trip ends per 1,000 square feet of floor area} \\ \times \\ 0.50 \text{ adjustment factor for inbound trips} \\ \times \\ 2.82 \text{ average miles per trip in south service area} \\ \times \\ 0.73 \text{ trip length adjustment factor for nonresidential development (except commercial)} \\ \times \\ \$287.05 \text{ net capital cost per VMT} \\ = \\ \$1,051 \text{ per 1,000 square feet (truncated)} \end{array}$$

Proposed 2014 fees for the south service area are compared to the current fees (see column labeled 2010 RRIF in Figure 12), with both dollar and percent change indicated. In the south service area, proposed fees are one percent higher than current fees for single-unit residential development and four percent less for residential development with two or more units per structure. For nonresidential development, proposed fees decrease for all development types except Nursing Home, which will have a RRIF increase of nine percent.

**Figure 12 – RRIF Schedule for South Service Area**

**Input Variables**

Average Miles per Trip		2.82					
RRIF Share of CIP		\$100,474,800					
VMT Increase Over Ten Years		350,027					
Capital Cost per VMT		\$287.05					
ITE Code	Development Type	Development Unit	Avg Wkdy Veh Trip Ends	Trip Rate Adjustment	Trip Length Adjustment	Proposed 2014 RRIF	2010 RRIF (rounded)
<b>Residential</b>							
210	Single Unit	Dwelling	8.27	52%	121%	\$4,212	\$4,177
220	2+ Units per Structure	Dwelling	5.37	52%	121%	\$2,735	\$2,845
<b>Industrial</b>							
110	Light Industrial	1000 Sq Ft	6.97	50%	73%	\$2,059	\$2,534
140	Manufacturing	1000 Sq Ft	3.82	50%	73%	\$1,128	\$1,379
150	Warehouse	1000 Sq Ft	3.56	50%	73%	\$1,051	\$1,799
151	Mini-Warehouse	1000 Sq Ft	2.50	50%	73%	\$738	\$964
<b>Commercial</b>							
820	Retail and Eating/Drinking Places	1000 Sq Ft Leasable	42.70	33%	66%	\$7,528	\$8,681
RTC	Casino Gaming Area	1000 Sq Ft	46.05	50%	73%	\$13,605	\$16,699
<b>Office &amp; Other Services</b>							
320	Lodging	Room	5.63	50%	73%	\$1,663	\$3,291
412	Regional Park	Acre	2.28	50%	73%	\$673	\$653
520	Schools and Daycare	1000 Sq Ft	15.43	33%	73%	\$3,008	
610	Hospital	1000 Sq Ft	13.22	50%	73%	\$3,905	\$6,201
620	Nursing Home	1000 Sq Ft	7.60	50%	73%	\$2,245	\$2,054
710	Office and Other Services	1000 Sq Ft	11.03	50%	73%	\$3,258	\$3,991
720	Medical Office	1000 Sq Ft	36.13	50%	73%	\$10,674	\$11,970

## Projected Revenue from Regional Road Impact Fees

The revenue projection shown below assumes implementation of the proposed RRIF schedule in the north service area and that projected development over the next ten years is consistent with the land use assumptions described in Appendix A. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the impact fee revenue. The north RRIF revenue projection of approximately \$65.37 million over ten years (see Figure 13) approximates the cost of planned system improvements to be funded with impact fees. In addition to future impact fee revenue, RTC expects approximately \$177.44 million from other funding sources for growth-related capital improvements.

**Figure 13 – Projected RRIF Revenue in North Service Area**

**Ten-Year Cost of Street Improvements (rounded)**

RRIF Funding	Other Funding	Total
\$65,390,000	\$177,440,000	\$242,830,000

**Projected RRIF Revenue from North Service Area**

		Residential Single Unit \$3,784 per housing unit	Residential 2+ Units \$2,457 per housing unit	Industrial \$944 per 1000 Sq Ft	Commercial \$6,763 per 1000 Sq Ft	Office & Other Services \$2,927 per 1000 Sq Ft	
Year		Hsg Units	Hsg Units	Sq Ft x 1000	Sq Ft x 1000	Sq Ft x 1000	
Base	2014	82,709	32,164	12,061	6,330	12,614	
Year 1	2015	83,621	32,519	12,380	6,443	12,871	
Year 2	2016	84,543	32,878	12,708	6,558	13,133	
Year 3	2017	85,476	33,240	13,045	6,675	13,400	
Year 4	2018	86,419	33,607	13,391	6,794	13,673	
Year 5	2019	87,372	33,978	13,746	6,916	13,951	
Year 6	2020	88,335	34,353	14,110	7,039	14,235	
Year 7	2021	89,310	34,732	14,484	7,165	14,525	
Year 8	2022	90,295	35,115	14,868	7,293	14,820	
Year 9	2023	91,291	35,502	15,263	7,424	15,122	
Year 10	2024	92,298	35,894	15,667	7,556	15,430	
<b>Ten-Yr Increase</b>		9,589	3,730	3,606	1,226	2,816	
<b>Fee Revenue =&gt;</b>		\$36,280,000	\$9,160,000	\$3,400,000	\$8,290,000	\$8,240,000	
						<b>Total RRIF Revenue (rounded) =&gt;</b>	\$65,370,000

The south service area revenue projection (shown below) assumes implementation of the proposed RRIF schedule and that projected development over the next ten years is consistent with the land use assumptions described in Appendix A. To the extent the rate of development either accelerates or slows down, there will be a corresponding change in the impact fee revenue. The south RRIF revenue projection of approximately \$100.46 million over ten years (see Figure 14) approximates the cost of planned system improvements to be funded with impact fees. In addition to future impact fee revenue, RTC expects approximately \$413.49 million from other funding sources for growth-related capital improvements in the south service area.

**Figure 14 – Projected RRIF Revenue in South Service Area**

**Ten-Year Cost of Street Improvements (rounded)**

RRIF Funding	Other Funding	Total
\$100,470,000	\$413,490,000	\$513,960,000

**Projected RRIF Revenue from North Service Area**

		Residential Single Unit \$4,212 per housing unit	Residential 2+ Units \$2,735 per housing unit	Industrial \$1,051 per 1000 Sq Ft	Commercial \$7,528 per 1000 Sq Ft	Office & Other Services \$3,258 per 1000 Sq Ft
Year		Hsg Units	Hsg Units	Sq Ft x 1000	Sq Ft x 1000	Sq Ft x 1000
Base	2014	51,742	20,122	45,444	17,833	31,947
Year 1	2015	52,556	20,439	46,168	18,159	32,500
Year 2	2016	53,384	20,761	46,904	18,490	33,063
Year 3	2017	54,225	21,087	47,651	18,828	33,636
Year 4	2018	55,079	21,419	48,411	19,172	34,219
Year 5	2019	55,945	21,757	49,182	19,522	34,811
Year 6	2020	56,826	22,099	49,966	19,878	35,414
Year 7	2021	57,721	22,447	50,762	20,241	36,028
Year 8	2022	58,630	22,800	51,571	20,611	36,652
Year 9	2023	59,553	23,159	52,393	20,987	37,287
Year 10	2024	60,490	23,524	53,228	21,370	37,933
<b>Ten-Yr Increase</b>		<b>8,748</b>	<b>3,402</b>	<b>7,784</b>	<b>3,537</b>	<b>5,986</b>
<b>Fee Revenue =&gt;</b>		<b>\$36,850,000</b>	<b>\$9,300,000</b>	<b>\$8,180,000</b>	<b>\$26,630,000</b>	<b>\$19,500,000</b>
<b>Total RRIF Revenue (rounded) =&gt;</b>						<b>\$100,460,000</b>

## APPENDIX A: LAND USE ASSUMPTIONS

As defined in NRS 278B.060, “land use assumptions” means projections of changes in land use, densities, intensities and population for a specified service area, over a period of at least ten years, and in accordance with the master plan of the local government. In NRS 278B.100 “service area” is defined as any specified area within the boundaries of a local government in which new development necessitates capital improvements or facility expansions and within which new development is served directly and benefited by the capital improvement or facility expansion as set forth in the capital improvements plan.

### Key Growth Indicators

Population and job projections from the 2012 Consensus Forecast were used to derive the Regional Road Impact Fees (RRIF) for the north and south service areas. TischlerBise obtained 2010 and 2025 population and job data, with interim years derived using a compound growth equation. Dividing annual population projections by the average number of persons per housing unit yields projected housing units by service area.

### Persons per Housing Unit

The 2010 census did not obtain detailed information using a “long-form” questionnaire. Instead, the U.S. Census Bureau has switched to a continuous monthly mailing of surveys, known as the American Community Survey (ACS), which is limited by sample-size constraints. For example, data on detached housing units are now combined with attached single units (commonly known as townhouses).

TischlerBise recommends that impact fees be imposed for two residential categories. According to the U.S. Census Bureau, a household is a housing unit that is occupied by year-round residents. Development fees often use per capita standards and persons per housing unit, or persons per household, to derive proportionate-share fee amounts. TischlerBise recommends that fees for residential development be imposed according to the number of year-round residents per housing unit. As shown Figure A1, the U.S. Census Bureau estimates Washoe County had 185,289 housing units in 2012. Dwellings with a single unit per structure (detached, attached, and mobile homes) averaged 2.49 persons per housing unit. Even though townhouses are attached, each unit is on an individual parcel and is considered to be a single unit. Dwellings in structures with multiple units averaged 1.77 year-round residents per unit. This category includes duplexes, which have two dwellings on a single land parcel. The overall average is 2.28 year-round residents per housing unit.

**Figure A1 – Persons per Unit by Type of Housing in Washoe County**

Units in Structure	Renter & Owner			Housing Units	Persons per Housing Unit	Housing Mix
	Persons	Households	Persons per Household			
Single Unit*	331,138	120,491	2.75	133,117	2.49	72%
2+ Units	92,154	43,411	2.12	52,172	1.77	28%
Subtotal	423,292	163,902	2.58	185,289	2.28	Vacancy Rate 12%
Group Quarters	6,616					
<b>TOTAL</b>	<b>429,908</b>	<b>163,902</b>		<b>185,289</b>		

\* Single family includes detached, attached, and mobile homes.

Source: Tables B25024, B25032, B25033, and B26001.

2012 1-Year Estimates, American Community Survey, U.S. Census Bureau.

## Customized Trip Generation Rates per Housing Unit

As an alternative to simply using the national average trip generation rate for residential development, the Institute of Transportation Engineers (ITE) publishes regression curve formulas that may be used to derive custom trip generation rates, using local demographic data. Key independent variables needed for the analysis (i.e. vehicles available, housing units, households and persons) are available from American Community Survey data for Washoe County. Customized average weekday trip generation rates by type of housing are shown in Figure A2. A vehicle trip end represents a vehicle either entering or exiting a development, as if a traffic counter were placed across a driveway. The custom trip generation rates for Washoe County are lower than national averages. For example, single-unit residential development in Washoe County is expected to produce 8.27 average weekday vehicle trip ends per dwelling, which is lower than the national average of 9.57 (see ITE code 210). For apartments (ITE 220) the national average is 6.65 trips ends per dwelling on an average weekday. The recommended custom rate of 5.37 for Washoe County is lower than the national average.

**Figure A2 - Residential Trip Generation Rates by Type of Housing**

Washoe County, Nevada		Households (2)			Vehicles per Household by Tenure
Vehicles Available (1)	Single Unit per Structure	2+ Units per Structure	Total		
Owner-occupied	198,288	90,066	3,167	93,233	2.13
Renter-occupied	95,390	30,425	40,244	70,669	1.35
<b>TOTAL</b>	<b>293,678</b>	<b>120,491</b>	<b>43,411</b>	<b>163,902</b>	<b>1.79</b>
Housing Units (6) =>		133,117	52,172	185,289	

Units per Structure	Persons (3)	Trip Ends (4)	Vehicles by Type of Housing	Trip Ends (5)	Average Trip Ends	Trip Ends per Housing Unit
Single Units	331,138	856,992	232,621	1,344,672	1,100,832	<b>8.27</b>
2+ Units	92,154	319,710	61,057	240,860	280,285	<b>5.37</b>
<b>TOTAL</b>	<b>423,292</b>	<b>1,176,702</b>	<b>293,678</b>	<b>1,585,532</b>	<b>1,381,117</b>	<b>7.45</b>

n Community Survey, 2012.

## Floor Area of Nonresidential Development

In Figure A3, gray shading indicates three nonresidential development prototypes used by TischlerBise to convert job projections into nonresidential floor area estimates. Average weekday vehicle trip generation rates are from the Institute of Transportation Engineers (ITE 2012). The prototype for industrial jobs is “Warehousing”. The prototype for commercial development, including retail and eating/drinking places, is an average-size shopping center. The prototype for all other service jobs is an average-size general office building.

**Figure A3 – Employee and Building Area Ratios**

ITE Code	Land Use / Size	Demand Unit	Wkdy Trip Ends Per Dmd Unit*	Wkdy Trip Ends Per Employee*	Emp Per Dmd Unit	Sq Ft Per Emp
110	Light Industrial	1,000 Sq Ft	6.97	3.02	2.31	433
130	Industrial Park	1,000 Sq Ft	6.83	3.34	2.04	489
140	Manufacturing	1,000 Sq Ft	3.82	2.13	1.79	558
150	Warehousing	1,000 Sq Ft	3.56	3.89	0.92	1,093
254	Assisted Living	bed	2.66	3.93	0.68	na
320	Motel	room	5.63	12.81	0.44	na
520	Elementary School	1,000 Sq Ft	15.43	15.71	0.98	1,018
530	High School	1,000 Sq Ft	12.89	19.74	0.65	1,531
540	Community College	student	1.23	15.55	0.08	na
550	University/College	student	1.71	8.96	0.19	na
565	Day Care	student	4.38	26.73	0.16	na
610	Hospital	1,000 Sq Ft	13.22	4.50	2.94	340
620	Nursing Home	1,000 Sq Ft	7.60	3.26	2.33	429
710	General Office (avg size)	1,000 Sq Ft	11.03	3.32	3.32	301
760	Research & Dev Center	1,000 Sq Ft	8.11	2.77	2.93	342
770	Business Park	1,000 Sq Ft	12.44	4.04	3.08	325
820	Shopping Center (avg size)	1,000 Sq Ft	42.70	na	2.00	500

\* Trip Generation, Institute of Transportation Engineers, 9th Edition (2012).

## APPENDIX B: 2014 RRIF SCHEDULE BY SERVICE AREA

The table below provides a concise summary of the proposed 2014 RRIF fee schedule for both service areas.

<i>RRIF Input Variables</i>			<i>North</i>		<i>South</i>	
Average Miles per Trip			2.87		2.82	
RRIF Share of CIP			\$65,394,800		\$100,474,800	
VMT Increase Over Ten Years			258,081		350,027	
Capital Cost per VMT			\$253.39		\$287.05	
<i>ITE Code</i>	<i>Development Type</i>	<i>Development Unit</i>	<i>VMT North</i>	<i>2014 RRIF North</i>	<i>VMT South</i>	<i>2014 RRIF South</i>
<b><i>Residential</i></b>						
210	Single Unit	Dwelling	14.93	\$3,784	14.67	\$4,212
220	2+ Units per Structure	Dwelling	9.70	\$2,457	9.53	\$2,735
<b><i>Industrial</i></b>						
110	Light Industrial	1000 Sq Ft	7.30	\$1,850	7.17	\$2,059
140	Manufacturing	1000 Sq Ft	4.00	\$1,013	3.93	\$1,128
150	Warehouse	1000 Sq Ft	3.73	\$944	3.66	\$1,051
151	Mini-Warehouse	1000 Sq Ft	2.62	\$663	2.57	\$738
<b><i>Commercial</i></b>						
820	Retail and Eating/Drinking Places	1000 Sq Ft Leasable	26.69	\$6,763	26.23	\$7,528
RTC	Casino Gaming Area	1000 Sq Ft	48.24	\$12,223	47.40	\$13,605
<b><i>Office &amp; Other Services</i></b>						
320	Lodging	Room	5.90	\$1,494	5.79	\$1,663
412	Regional Park	Acre	2.39	\$605	2.35	\$673
520	Schools and Daycare	1000 Sq Ft	10.67	\$2,703	10.48	\$3,008
610	Hospital	1000 Sq Ft	13.85	\$3,509	13.61	\$3,905
620	Nursing Home	1000 Sq Ft	7.96	\$2,017	7.82	\$2,245
710	Office and Other Services	1000 Sq Ft	11.55	\$2,927	11.35	\$3,258
720	Medical Office	1000 Sq Ft	37.85	\$9,590	37.19	\$10,674