

The Economics of Land Use



Solano County Regional Transportation Impact Fee Nexus Report

Prepared for:

Solano County Board of Supervisors
and
Solano Transportation Authority

Prepared by:

Economic & Planning Systems, Inc. and
Fehr & Peers

June 28, 2013

EPS #19016

*Economic & Planning Systems, Inc.
2501 Ninth Street, Suite 200
Berkeley, CA 94710-2257
510 841 9190 tel
510 841 9208 fax*

*Berkeley
Denver
Los Angeles
Sacramento*

www.epsys.com

Table of Contents

1.	INTRODUCTION AND SUMMARY OF FINDINGS.....	1
	Nexus Report Overview	1
	Summary of Fees.....	2
	Key Issues and Assumptions	4
2.	RTIF GROWTH PROJECTIONS	6
	Growth Projections.....	6
	Dwelling Unit Equivalent Calculations	8
3.	RTIF CAPITAL PROJECTS AND COSTS	11
	RTIF Priority Projects and Costs.....	11
	Changes to RTIF Priority Projects.....	13
4.	RTIF NEXUS ANALYSIS AND FEE CALCULATION.....	14
	Existing Traffic Conditions.....	14
	Transportation Modeling	15
	Calculation of Maximum Fee.....	19

APPENDIX A: Project-Specific Trip Percentage Documentation

List of Tables

Table 1	Maximum Allowable Fee Level.....	3
Table 2	Total RTIF Priority Project Costs.....	4
Table 3	RTIF Growth Forecasts by Jurisdiction (2013-33)	7
Table 4	Land Use Growth Forecasts	8
Table 5	Dwelling Unit Equivalent Assumptions.....	9
Table 6	Growth Converted into DUEs (2013 – 33)	10
Table 7	RTIF Priority Project Cost Estimates.....	12
Table 8	Regional Trip Percentages for Priority RTIF Projects.....	18
Table 9	RTIF Project Cost Per DUE.....	19
Table 10	Maximum Allowable Fee by Land Use Category	20

1. INTRODUCTION AND SUMMARY OF FINDINGS

This Technical Report (“Report”) is designed to provide Solano County with the necessary technical documentation and nexus analysis supporting the adoption of a Regional Transportation Impact Fee (RTIF). It has been prepared by Economic & Planning Systems, Inc. (EPS) and Fehr & Peers Associates Inc., for Solano County and the Solano Transportation Authority (STA). The RTIF program described herein is consistent with the most recent relevant case law and the principles of AB1600 or Government Code Section 66000 et seq (“Fees for Development Projects”; except where specific citations are provided, these statutes will be referred to in this Report as AB 1600).

This study effort was initiated by the STA and is being completed in connection with Solano County as part of its Public Facility Fee (PFF) update. The study process has included input from variety of stakeholders, including representatives from County jurisdictions as well as developer, housing, and environmental interests. Specifically, the methodology, assumptions and overall structure of the RTIF have been developed with both technical input from two Technical Working Groups (TWGs) consisting of staff from the County and its seven (7) municipalities. In addition, the Report incorporates guidance received by a Stakeholder Committee (SC) consisting of representatives from various community interest groups, and a Policy Committee (PC) composed of the members of the STA Board, the STA Executive Directors, and the Chief Executive Officers of the STA’s member agencies.

Following this introductory chapter, **Chapter 2** discusses population and employment growth potential used in this analysis and **Chapter 3** describes the methodology for identifying “priority RTIF project” and estimating their costs. **Chapter 4** describes the modeling techniques used to establish nexus for the RTIF and the resulting RTIF fee calculation by land use category. Finally, **Chapter 5** discusses implementation and legal considerations.

Nexus Report Overview

The RTIF program described in this Report will provide funding for regional transportation improvements required to serve new development and to ensure that desired service levels can be achieved and/or maintained. To the extent that required improvements serve both new and existing development, or travel through the Solano County, only the portion that is attributable to new development inside the region is included in the RTIF program. It is expected that the RTIF program funding will be augmented by other revenue sources to meet overall funding requirements, including local, State, and Federal sources.

This Report provides a schedule of fees to be established and collected as a part of the County Public Facilities Fee. The proposed RTIF program fee, if approved, will need to be included in the adoption of a County Resolution authorizing its collection as a component of the current County Public Facilities Fee program. The current enabling Ordinance allows the County to adopt, by Resolution, a fee schedule consistent with supporting technical analysis and findings. The Resolution approach to setting the fee allows periodic adjustments of the fee amount that may be necessary over time, without amending the enabling Ordinance.

This Report and the technical information it contains should be reviewed periodically by the County and STA as necessary to ensure its accuracy and to enable the adequate programming of funding sources. To the extent that improvement requirements, costs, or development potential changes over time, the RTIF program will need to be updated.

This Report does not determine, or advocate for, a particular fee level. Rather its purpose is to calculate the maximum allowable fee that could be charged pursuant to the requirements of AB 1600. In addition, the following considerations are important in reviewing this Report:

- The acceptance or approval of this Report does not, in itself, constitute the approval of the RTIF or a corresponding fee schedule. This can only occur through the approval of a required Resolution by the County Board of Supervisors.
- The acceptance or approval of this Report or the RTIF does not constitute approval for a particular transportation project or set of improvements. The funding and approval of the particular transportation improvements identified as part of the RTIF will be subject to the same approval and entitlement process that would be applicable in the absence of this fee program.
- The acceptance or approval of this Report or the RTIF does not constitute approval for any particular land use program or project. The entitlement and permitting process for future land use development in the County and its individual jurisdictions will remain the same regardless of whether the RTIF is approved.
- Any revenue generated from fees collected as part of the RTIF must be segregated into a designated account and only used for purposes prescribed therein (i.e., in the RTIF Resolution). In other words, fee revenue collected pursuant to the RTIF can only be used to fund RTIF projects.

Summary of Fees

A summary of the maximum RTIF fees calculated by land use category are provided in **Table 1**. The fees shown represent the maximum RTIF fee that can be charged based on the nexus findings described in this Report. The maximum fees estimated assume one County-wide fee for each land use. These fees are calculated to generate sufficient revenue to cover the RTIF capital facility costs associated with new development throughout the County. The fee levels are based on the proportion of RTIF facility costs attributable to the growth in regional trips as a result of new development in the County.¹

¹ A "regional trip" is defined in this Report as one that crosses at least one jurisdictional boundary and originates and/or terminates in a Solano County jurisdiction.

Table 1 Maximum Allowable Fee Level

Land Use Category	Maximum RTIF / Unit ¹
Residential	
Single Family Residential (SFR)	\$7,952 / Unit
Multi Family Residential (MFR)	\$4,930 / Unit
2nd SFR Unit/Accessory Unit	\$4,268 / Unit
MFR Senior/Retirement Housing	\$3,101 / Unit
Non-residential	
Retail/Commercial	\$14,750 / 1,000 Sq.Ft.
Service Commercial	\$36,580 / 1,000 Sq.Ft.
Assembly Uses	\$2,799 / 1,000 Sq.Ft.
General/Medical Office	\$9,123 / 1,000 Sq.Ft.
Hotels/Motels	\$2,790 / Room
Industrial	\$5,948 / 1,000 Sq.Ft.
Warehouse/Distribution	\$1,081 / 1,000 Sq.Ft.
Institutional	
Health Care Facility	\$6,734 / 1,000 Sq.Ft.
Congregate Care Facility	\$1,590 / Unit
Private School/Day Care Facility	\$39,168 / 1,000 Sq.Ft.
Agricultural Uses	
Riding Arena ²	\$7,634 / Acre
Barn	\$1,018 / 1,000 Sq.Ft.

[1] The maximum RTIF is based on new regional trips. Local fee programs can also include RTIF facilities based on local trips and/or revenue shortfalls resulting from reductions to the maximum RTIF level.

[2] If a barn is included in the development than that portion of the project is charged separately based on the rate shown for "Barn".

A summary of the transportation projects and corresponding costs included in the RTIF program is provided in **Table 2**. As shown, the current project list includes eleven (11) "priority" RTIF transportation projects approved by the STA Board for a total cost of approximately \$402.5 million. Of this amount approximately \$227.8 million or 54 percent is allocated to the RTIF program based on the nexus analysis.

Table 2 Total RTIF Priority Project Costs

RTIF Project	Total RTIF Project Cost		% New Regional Trips	Total RTIF Project Cost	
	Amount	% of total		Amount	% of total
#1 - Jepson Parkway	\$208,100,000	52%	58%	\$122,779,000	54%
#2 - Peabody Road	\$5,000,000	1%	78%	\$3,900,000	2%
#3 - SR 12/Pennsylvania Avenue	\$50,000,000	12%	71%	\$35,500,000	16%
#4 - SR 12/Church Road	\$10,410,000	3%	35%	\$3,643,500	2%
#5 - SR 37/Redwood Pkwy/ Fairgrounds Dr.	\$65,000,000	16%	32%	\$20,800,000	9%
#6 - Benicia Industrial Park Access	\$20,000,000	5%	77%	\$15,400,000	7%
#7 - Columbus Parkway	\$1,000,000	0.2%	92%	\$920,000	0%
#8 - North Connector	\$37,990,000	9%	60%	\$22,794,000	10%
#9 - SR 113 Improvements	\$4,990,000	1.2%	41%	\$2,045,900	1%
#10 County Rd. Projects	\$12,626,431	3%	17%	\$2,189,726	1%
#11 Regional Transit Project	\$12,626,431	3%	17%	\$2,189,726	1%
	-----		-----	-----	
Total / Weighted Avg	\$402,490,000	100%	54%	\$227,782,400	100%

The County may as a matter of policy decide to charge a fee below the maximum fee legally allowed based on the nexus calculations presented herein for any or all of the land uses.²

Key Issues and Assumptions

The calculation of the traffic impact fees is based on a variety of assumptions regarding land use, growth potential, service standards, and facility costs, as documented in subsequent chapters of this Report. However, some of the key issues that may warrant on-going consideration during the implementation of the RTIF program include:

- Land Use Assumptions.** The impact fee calculations are based on commercial, industrial, and residential growth potential at buildout in Solano County through 2033. If the growth does not materialize as expected, the corresponding facilities will not be needed and/or impact fee revenue will not be sufficient to pay for facilities planned to accommodate growth. Consequently, the estimates of development and population should be periodically reviewed and updated.
- Travel Demand Model.** The nexus calculations and analysis used to calculate maximum fees by land use category are based on the recently updated version of the STA travel demand model. Fehr & Peers worked with a modeling Technical Advisory Committee to validate and update the base year 2013 and build-out year 2033 assumptions embodied in

² The revenue shortfall to the RTIF program that would result from reducing the fees must ultimately be made up by other non-RTIF revenue sources to ensure that the projects actually get built. Individual jurisdictions may elect to make up all or a portion of this shortfall through their local fee programs.

this model. This model calculates the demand that projected growth will generate for regional transportation improvements and thus serves the basis for estimating a “fair share” cost allocation.

- **Eligible and Selected RTIF Projects:** The maximum fee calculated based on 11 specific transportation projects that were selected based on input from the Technical Working Group (TWG), Stakeholder Committee (SC), and Policy Committee (PC) and ultimately approved by the STA Board on May 8, 2013. These projects were also reviewed to ensure that they meet the nexus requirements of AB 1600.
- **Consistency with Local Fee Programs:** Jurisdictions in Solano County may implement their own impact fee programs which may include facilities that overlap with those included in the RTIF. To avoid double-counting (i.e. charging a developer twice for the same improvements), these local fees should be developed in a way that is cognizant of the difference (shortfall) between the maximum allowable RTIF and the actual RTIF, and of the difference between regional impacts (as defined in this study) and local impacts which may be defined differently by individual jurisdictions.
- **Cost Estimates.** The fee calculations embody facility cost assumptions that have been developed based on published studies where available, City, County and STA staff estimates, as well as additional cost analysis provided by Mark Thomas & Company, Inc., a civil engineer retained by the STA as part of the Study. The cost estimates are intended for planning purposes, and will be further refined over time as individual capital improvement projects are designed. As with the estimates of growth, the cost estimates should be periodically reviewed and updated.

2. RTIF GROWTH PROJECTIONS

The RTIF is a one-time fee levied on new development at a rate proportional to its demand for transportation capital improvements. Thus, a forecast of new development in Solano County is required to calculate the fee. This Chapter documents the land use growth assumptions used to calculate the RTIF program fee. Specifically, it describes the amount of residential, retail, and commercial/industrial land use development expected to occur in Solano County through the year 2033. These estimates are used for the following primary purposes in the fee calculation:

- Estimates of existing and future development are used to evaluate future traffic levels and determine the need for transportation improvements in Solano County.
- Estimates of future development are used to allocate the costs of required transportation improvements and ultimately to calculate a fee per unit of new growth.

The following sections describe the development projections and the key assumptions underlying them.

Growth Projections

Table 3 provides the population and employment forecasts by jurisdiction used in the RTIF modeling process which, for consistency, are the same projections being used as part of Solano County's broader PFF update. The projections incorporate a variety of analytical steps and data sources, as summarized below:

1. The County-wide population and employment growth forecasts are based on the average growth rate estimates from the most recent Association of Bay Area Governments (ABAG), California Department of Finance (DOF), and Woods & Poole (employment excludes DOF) projections.
2. The baseline, year 2013, population and employment estimates at the jurisdiction level are based on benchmark estimates from the 2010 Census and ABAG, respectively. To obtain the 2013 baseline estimates, EPS applied countywide annual growth rates between 2010 and 2012 in population from DOF and job growth based on California Employment Development Department (EDD) to the 2010 benchmark estimates.
3. The allocation of growth between these areas is based on the existing STA traffic model. Specifically, the STA model jurisdiction level forecasts have been normalized to the County total but maintain their relative growth ratios. For example, if a jurisdiction accounted for 5 percent of the County's growth through 2033 in the STA model it is assumed to account for 5 percent of growth in the PFF projection (albeit the absolute growth is adjusted to conform to the revised County total).

Table 3 RTIF Growth Forecasts by Jurisdiction (2013-33)

Jurisdiction	Amount by Year		2013 - 2033 Growth ¹	
	2013	2033	Total	Avg. Annual
Population				
Benicia	27,141	28,495	1,354	0.24%
Dixon	18,433	25,862	7,429	1.71%
Fairfield	107,258	120,356	13,098	0.58%
Rio Vista	7,479	17,281	9,802	4.28%
Suisun City	28,209	33,352	5,143	0.84%
Vacaville	92,853	105,475	12,623	0.64%
Vallejo	116,885	132,420	15,535	0.63%
Unincorporated	<u>18,945</u>	<u>19,578</u>	<u>633</u>	<u>0.16%</u>
County Total²	417,203	482,821	65,617	0.73%
Employment				
Benicia	14,466	16,560	2,094	0.68%
Dixon	4,489	4,754	266	0.29%
Fairfield	40,286	49,424	9,139	1.03%
Rio Vista	1,965	3,591	1,626	3.06%
Suisun City	3,192	4,232	1,040	1.42%
Vacaville	30,336	35,304	4,968	0.76%
Vallejo	32,549	40,790	8,241	1.13%
Unincorporated	<u>8,074</u>	<u>8,667</u>	<u>593</u>	<u>0.35%</u>
County Total³	135,357	163,322	27,965	0.94%

[1] Growth allocation between jurisdictions is based on relative growth rates assumed in the STA model.

[2] County-wide population growth based on the average annual growth rates from ABAG, DOF, and Woods & Poole between 2010 and 2030.

[3] County-wide employment growth based on the average annual growth rate of ABAG and Woods & Poole.

Source: Economic & Planning Systems.

The regional household and employment projections provided above form the basis for developing growth forecasts by land use category that are used to estimate travel demand. Specifically, the 2013 through 2033 household and employment projections are used to estimate future residential, retail, and commercial/industrial development. For employment projections, approximately 350 square feet per retail employee and 375 square feet for all other employment categories are assumed to estimate the commercial/industrial development. **Table 4** summarizes these estimates.

Table 4 Land Use Growth Forecasts

Land Use Category	Existing (Year 2013)	Total Growth (2013 - 33)
Residential¹		
Single Family	102,349	14,675
Multi-Family	<u>37,314</u>	<u>8,959</u>
Subtotal	139,663	23,634
Employment		
Retail	29,302	6,233
Other	<u>106,767</u>	<u>22,030</u>
Subtotal	136,069	28,263
Square Feet		
Retail ²	10,255,700	2,181,550
Other ³	<u>40,037,625</u>	<u>8,261,250</u>
Subtotal	50,293,325	10,442,800

- [1] Based on population projections in Table 3 and allocation between single-family and multi-family developed as part of the STA Travel Demand Model.
 [2] Calculations assume 350 square feet per employee.
 [3] Calculations assume 375 square feet per employee.

Dwelling Unit Equivalent Calculations

This analysis relies on Dwelling Unit Equivalent (DUE) factors to compare and evaluate future development across land use categories. Specifically, DUE factors compare residential, retail, and commercial/industrial land uses to one another based on their vehicle trip generation rates in order to develop a common metric for analysis. The factors used to convert residential, commercial/industrial, and retail growth into DUEs are shown in **Table 5**, and are based on standard assumptions regarding trip generation and trip diversion.³

³ Assumptions based on data from the Institute of Transportation Engineers (ITE) Trip Generation Model (9th Edition) and the San Diego Council of Governments (SANDAG) Brief Guide to Vehicular Traffic Generation Rates, July 1998.

Table 5 Dwelling Unit Equivalent Assumptions

Fee Category	Unit Type	Pk Hour	% New	DUE
		Trip Rate ¹	Trips ²	Calculation
		a	b	c = a * b
Residential				
Single Family Residential (SFR)	/ Unit	1.00	100%	1.00
Multi Family Residential (MFR)	/ Unit	0.62	100%	0.62
2nd SFR Unit/Accessory Unit	/ Unit	0.54	100%	0.54
MFR Senior/Retirement Housing	/ Unit	0.39	100%	0.39
Non-residential				
Retail/Commercial	/ 1,000 Sq.Ft.	3.71	50%	1.86
Service Commercial	/ 1,000 Sq.Ft.	9.02	51%	4.60
Assembly Uses	/ 1,000 Sq.Ft.	0.55	64%	0.35
General/Medical Office	/ 1,000 Sq.Ft.	1.49	77%	1.15
Hotels/Motels	/ Room	0.605	58%	0.35
Industrial	/ 1,000 Sq.Ft.	0.88	85%	0.75
Warehouse/Distribution	/ 1,000 Sq.Ft.	0.16	85%	0.14
Institutional				
Health Care Facility	/ 1,000 Sq.Ft.	1.16	73%	0.85
Congregate Care Facility	/ Unit	0.20	100%	0.20
Private School/Day Care Facility	/ 1,000 Sq.Ft.	11.59	43%	4.93
Agricultural Uses				
Riding Arena ³	/ Acre	1.50	64%	0.96
Barn	/ 1,000 Sq.Ft.	0.16	80%	0.13

[1] Reflects average number of trips at peak hour of day for the unit type indicated based on data from the Institute of Transportation Engineers (ETI)

[2] Discount to peak trip rate to account for pass-through or loaded trips.

[3] If a barn is included in the development than that portion of the project is charged separately based on the rate shown for "Barn".

The DUE factors described above are then used to calculate total DUE growth by land use and jurisdiction. Specifically, the land use growth forecasts presented in Table 4 are multiplied by the DUE factors in Table 5 to derive total DUE growth. The results of these calculations are presented in **Table 6**. It should be noted that the STA land use projections do not include the same level of detail as the Fee and DUE categories shown in **Table 5** (e.g., the STA land use projections do not specify the number of hotel rooms, riding arenas or barns that will be developed in the County through 2033). Consequently, the conversion from land use growth

(e.g., residential units and commercial square feet) to DUE growth aggregates certain land use categories. Overall these calculations result in a 17 percent increase in DUEs Countywide between 2013 through 2033.

Table 6 Growth Converted into DUEs (2013 – 33)

Category / Jurisdiction	Single Family	Multi-Family	Retail¹	Other Employment²	Total
Land Use Growth (units or jobs)					
Benicia	261	260	0	2,089	
Dixon	2,230	198	146	116	
Fairfield	1,603	3,182	1,839	7,373	
Rio Vista	2,858	1,446	392	1,356	
Suisun City	1,138	497	109	952	
Vacaville	3,897	700	1,633	3,335	
Vallejo	2,563	2,673	2,114	6,220	
Unincorporated	<u>125</u>	<u>3</u>	<u>0</u>	<u>589</u>	
Total	14,675	8,959	6,233	22,030	
DUE Conversion Factor (see Table 5)					
	1.00	0.62	1.86	0.60	
DUE Growth					
Benicia	261	161	0	467	889
Dixon	2,230	123	95	26	2,473
Fairfield	1,603	1,973	1,194	1,647	6,416
Rio Vista	2,858	897	255	303	4,312
Suisun City	1,138	308	71	213	1,730
Vacaville	3,897	434	1,060	745	6,136
Vallejo	2,563	1,657	1,373	1,389	6,982
Unincorporated	<u>125</u>	<u>2</u>	<u>0</u>	<u>132</u>	<u>258</u>
Total	14,675	5,555	4,047	4,920	29,196
Existing DUEs					
	102,349	23,135	19,024	23,844	168,352
% Growth	14%	24%	21%	21%	17%

[1] Calculations assume 350 square feet per employee.

[2] Calculations assume 375 square feet per employee.

3. RTIF CAPITAL PROJECTS AND COSTS

This chapter documents the transportation improvements included in the initial RTIF capital project list and their corresponding costs. The RTIF capital project list includes all the projects that are assumed to be funded, in full or in part, by RTIF revenue and thus form the basis for the fee calculation. To meet the requirements of AB 1600, the transportation facilities included in the RTIF project list are needed in whole or in part to accommodate the impacts of growth in the County.

RTIF Priority Projects and Costs

As part of the RTIF study process, the STA convened numerous study sessions and public meetings with staff from the County's eight jurisdictions and other stakeholders to identify the priority projects that would be included in the regional fee program that will be impacted by regional growth throughout the County.⁴ In addition, all of the projects proposed and ultimately included in the RTIF Priority Project list have been reviewed to ensure consistency with the requirements of AB 1600. Based on this input and analysis, a final "RTIF Priority Project" list has been approved by the STA Board on May 8, 2013.

A description of the RTIF Priority Project list used to develop the fee calculated in this Report is provided in **Table 7**. As shown, there are 11 separate proposed RTIF projects with an estimated total capital cost of about \$427.8 million. The cost estimates are based on the best information available at the time of this Report. To the extent that this project list and/or the corresponding cost estimates are updated, the maximum fee amount will change accordingly.

⁴ The project list was developed based on input from two Technical Working Groups (TWGs) consisting of staff from the County and its seven (7) municipalities. In addition, it incorporates policy guidance received by a Stakeholder Committee (SC) consisting of representatives from various community interest groups, and a Policy Committee (PC) composed of the members of the STA Board, the STA Executive Directors, and the Chief Executive Officers of the STA's member agencies.

Table 7 RTIF Priority Project Cost Estimates

RTIF Project	Description	Project Costs
#1 - Jepson Parkway	Construct remaining segments of Jepson Parkway	\$208,100,000 ¹
#2 - Peabody Road	Widen from 2 to 4 lanes	\$5,000,000
#3 - SR 12/Pennsylvania Avenue	Construct new interchange	\$50,000,000
#4 - SR 12/Church Road	Improve intersection	\$10,410,000 ²
#5 - SR 37/Redwood Pkwy/ Fairgrounds Dr.	Widen roads and improve interchanges	\$65,000,000
#6 - Benicia Industrial Park Access	Add traffic signals and better accommodate trucks at I-680/Lake Herman Rd, and I-680/Park/Industrial	\$20,000,000
#7 - Columbus Parkway	Add traffic signal at Columbus/ Rose and improve westbound approach	\$1,000,000
#8 - North Connector	Construct North Connector from Business Center Drive to SR 12	\$37,990,000
#9 - SR 113 Improvements	TSM, TDM and ITS (e.g. incentives for carpooling, transit services, Park and Ride facilities, advance swerve warning signs, speed feedback signs and fog detection or closed circuit TV)	\$4,990,000 ³
#10 County Rd. Projects	Unincorporated County roadway improvements that address new growth impacts	\$12,626,431 ⁴
#11 Express Bus Transit Centers and Train Stations	<ul style="list-style-type: none"> • Benicia Industrial Park Multi-modal Transit Center • Dixon Multimodal Transportation Center • Fairfield Transportation Center, next phase • 360 Project Area Transit Center • Vallejo Station or Curtola Park & Ride, next phase • Vacaville Transportation Center, next phase • Suisun City Train Station improvements 	\$12,626,431 ⁴
Total RTIF Priority Project Cost		\$427,742,862

[1] Based on Fairfield new estimate provided in May 8, 2013 letter of request to include Peabody Road

[2] Based on a 6.17% escalation factor from 2010 to 2013 from the ENR San Francisco March Indices averaged between Construction Cost Index

[3] Based on a 5.89% escalation factor from 2009 to 2013 provided from the ENR San Francisco March Indices averaged between Construction Cost Index

[4] Calculated based on 5% percent of total DUE revenue assuming a fee of \$1,500 / DUE.

It should be noted that in addition to discrete transportation projects, the RTIF program includes two additional packages of improvements to address the impact of growth on the regional transportation system. One package includes major regional transit facilities, which could be either train stations or intermodal transfer centers that serve regional and express bus lines. The other package includes improvements to rural roads in unincorporated County areas that are affected by growth in the incorporated cities. It is proposed that 5 percent

of the RTIF revenue be directed to each of these project packages. The total cost for these packages is based on the maximum allowable nexus, as described further in the subsequent chapter.

The fee calculations embody facility cost assumptions that have been developed based on published studies where available, City, County and STA staff estimates, as well as additional cost analysis provided by Mark Thomas & Company, Inc., a civil engineer retained as part of the Study. Costs from studies published before 2013 were translated into year 2013 dollars using the Engineering News Record (ENR) construction cost index for the San Francisco Bay Area. The cost estimates are intended for planning purposes only, and will be refined over time as individual capital improvement projects are further developed and designed.

Changes to RTIF Priority Projects

While the initial RTIF Priority Project List was established as part of this Nexus Report, it is recognized that the list of transportation projects may need to be amended over time as circumstances change. In other words, the STA and participating jurisdictions will need to update the RTIF priority project list on a periodic basis as development occurs. Typically this would occur on a 5-year basis concurrent with AB 1600 statutory requirements for updating development impact fee programs.

4. RTIF NEXUS ANALYSIS AND FEE CALCULATION

This chapter describes the modeling techniques used to establish the basis for calculating the fee for the RTIF program. The fee per DUE is based on the cost of RTIF Priority Projects that can be attributable to new growth within Solano County divided by projected number of DUEs in the County.

Existing Traffic Conditions

By definition, a fee program charges fees to new development in order to fund transportation improvements necessary to serve the demand and impacts generated by that new development. The following procedure was used to determine if any of the transportation projects identified for inclusion in the RTIF are at locations that experience current traffic problems.

Available traffic analysis studies and reports were consulted, and the analysis of current traffic operations reported in those studies was reviewed to determine if any of the proposed RTIF projects are located on road facilities that currently operate at a level worse than LOS D during the peak hour; if that is the case, then that RTIF project would be at a location that is currently an "existing deficiency", and the cost of the capital improvement at that location would need to be divided between existing development and new development in proportion to their relative contribution to the deficiency.

For any location where there is an existing deficiency, the cost share attributable to new development, and therefore included in the RTIF, is calculated as follows:

1. Quantify the existing deficiency by determining the current traffic volumes that exceed the available capacity. For example, if a facility with a theoretical capacity of 2,000 vehicles is currently carrying 2,100 vehicles, the existing deficiency would be calculated as $2,100 - 2,000 = 100$.
2. Determine the future traffic growth by subtracting the current traffic volumes from the forecasted future traffic volumes. For example, if the future demand on that facility is projected to be 2,500 vehicles, the future traffic growth would be calculated as $2,500 - 2,100 = 400$.
3. Define the overall benefit of the project as the correction of the existing deficiency (from number 1 above) plus the accommodation of future growth (from number 2). In our example, the overall benefit of improving the road would be to correct the existing deficiency of 100 vehicles and to accommodate the future growth of 400 vehicles, for a total benefit of 500.
4. Calculate new development's share of the benefit as the result of number 2 divided by number 3. In this case, the share of the benefit to new development would be 80 percent, or 400 divided by 500. Therefore, 80 percent of the project cost would be included in the fee program. The remaining 20 percent of the project cost would need to be funded through other sources.

Existing Deficiency Evaluation

The results of the review of existing traffic information are shown in **Table 8**. As shown in that table, there was one location along the proposed Jepson Parkway project (at the intersection of Peabody Road and Cement Hill Road) where the traffic analysis results from a recent traffic study indicated peak hour operations at worse than LOS D conditions. This location was thus identified as an existing deficiency. The other RTIF projects did not have existing deficiencies.

The Jepson Parkway project involves a long corridor that extends between Fairfield and Vacaville. An existing deficiency was identified at a single location along that corridor. While that single location does not reflect conditions along the entire corridor, for the purposes of presenting a very conservative fee calculation it was decided to apply an existing deficiency discount to the total cost of the Jepson Parkway project. As part of the recently-adopted City of Fairfield traffic impact fee program update, an existing deficiency discount was calculated, per the approach outlined above, for the intersection of Peabody Road and Cement Hill Road; the resulting discount was calculated at 1 percent. Therefore, it is recommended that the cost of the Jepson Parkway project that is included in the RTIF be reduced by 1 percent.

Transportation Modeling

The adopted regional Solano-Napa Travel Model, which is the modeling tool approved for use in regional transportation planning efforts in Solano County, was used to establish the nexus between new development in Solano County and the capital improvement projects proposed for inclusion in the RTIF program. Information related to the proposed RTIF program was incorporated into the STA regional travel model, and a series of analyses were conducted to determine the proportion of usage on each RTIF facility that comes from new development in the Solano County region.

Background Assumptions

For the purposes of conducting the year 2033 RTIF analysis, it was necessary to determine what other, non-RTIF capital improvements are anticipated to be constructed by 2033. Based on direction from STA staff, the following improvements were assumed to be in place regardless of the status of the RTIF program:

- HOV/HOT lanes on I-80 and I-680 throughout the County
- Completion of Phase 1 of the I-80/I-680/SR 12 interchange improvements
- Widening of SR 12 West (Jameson Canyon) to 4 lanes from Red Top Road to SR 29

This is not intended to be an exhaustive list of all projects that would be constructed by 2033, but is intended to capture the most significant, large regional projects that are planned to be completed during that period. Undoubtedly there would be a number of local projects that could be completed during this timeframe, but for the purposes of the RTIF it is most important to capture the major regional projects and the effects those might have on regional traffic patterns.

Modeling Procedure

Using the STA regional travel model, the trip tables were separated into “baseline” and “growth” trip tables. The baseline trip table came from the 2013 model, and was subtracted from the 2033 trip table to produce a “growth” table that would represent the trips generated by new development. This is an important step since the fee will be charged only to new development, and is based on an evaluation of that new development’s effects on the RTIF projects. The baseline and growth trip tables were then assigned simultaneously to a year 2033 network that reflected the assumed projects described above as well as the proposed RTIF projects. This method allows for the production of a year 2033 traffic assignment, while still allowing each trip to be characterized as either part of the baseline or part of the growth increment.

Since the RTIF is a regional fee program, it is also important to identify the proportion of traffic on each facility that is regional in nature. For the purposes of this analysis, trips have been divided into regional and non-regional types. Regional trips are those trips that cross at least one jurisdictional boundary (e.g., trips that travel between two different jurisdictions in the County, or that have one end inside the County and one end outside the County). Non-regional trips would be all other types of trips, including those that pass through the County without stopping, or those trips that remain entirely within a single jurisdiction.⁵ One way of determining the “regional significance” of a project, then, would be to look at the percentage of regional trips that are anticipated to use that facility. This RTIF fee is based on growth in regional trips only.

Results

The results are shown in the attached **Table 9**. The table lists each of the RTIF projects and shows the percentage of the new traffic on the facility (i.e., the traffic resulting from new growth in Solano County) that falls within the category of regional trips, as described above. The percentage of new regional traffic on each facility will be used as the percentage of that facility’s improvement cost that will be considered eligible for inclusion in the RTIF program. Please see **Appendix A** for a more detailed table of modeling results for each project.

⁵ Note that local jurisdictions may be using different definitions of “regional” and “non-regional” trips in their local fee programs than the definitions used for the purposes of this RTIF analysis.

Table 9 Regional Trip Percentages for Priority RTIF Projects

RTIF Project	Existing Deficiency (see Table 8)	% of New Regional Vehicle Trips ¹	RTIF Cost Allocation
	a	b	= (1-a) * b
#1 - Jepson Parkway	1%	59%	58%
#2 - Peabody Road	0%	78%	78%
#3 - SR 12/Pennsylvania Avenue	0%	71%	71%
#4 - SR 12/Church Road	0%	35%	35%
#5 - SR 37/Redwood Pkwy/ Fairgrounds Dr.	0%	32%	32%
#6 - Benicia Industrial Park Access	0%	77%	77%
#7 - Columbus Parkway	0%	92%	92%
#8 - North Connector	0%	60%	60%
#9 - SR 113 Improvements	0%	41%	41%
#10 County Rd. Projects²	83%	100%	17%
#11 Regional Transit Projects²	83%	100%	17%

[1] Regional trips are defined in this Report as those that include more than one jurisdiction and originate or terminate somewhere in Solano County.

[2] Cost allocation assumed to equal 17% of total project costs, or the percent increase in County DUEs from 2013 - 33.

It should be noted that the intent of this analysis was solely for the purposes of the RTIF process. The primary result is the percentage of new trips projected to use each facility that are regional (i.e., that involve travel between Solano County jurisdictions, or between a jurisdiction inside the County and another outside the County). It is not intended for these results to be used to determine the appropriate size or configuration for any particular facility, or to directly support any project-specific planning activities.

As described earlier, the RTIF program also includes a set of regional transit and County road projects. Neither of these packages lends itself to being directly modeled using the regional Solano-Napa Travel Model described in this chapter. However, it is reasonable to include facilities such as these in a regional fee program, since by their nature they serve regional travel between jurisdictions in Solano County or between Solano County and neighboring counties.

These regional transit and County road projects are expected to benefit all County residents and workers, both those that are already in the County and those that will come to the County as a result of new development. Because it is not possible to directly model these projects using the regional Solano-Napa Travel Model, thus making it difficult to calculate the usage of these specific facilities by travelers generated by new development, it is instead proposed that the proportion of the projects' costs considered eligible for RTIF funding be calculated as the proportion of the total future population and employment in the County that is contributed by

new development. That percentage is 17 percent; that is, 17 percent of the total future population and employment in Solano County is anticipated to occur as a result of new growth during the planning horizon covered by this study.

Calculation of Maximum Fee

As described in **Chapter 2**, this analysis relies on DUE factors to compare and evaluate future development across land use categories. The maximum fee calculation is based on the net RTIF capital project costs attributable to new growth throughout the County divided by the projected number of new housing units, retail and commercial square feet developed in the Solano County from 2013 through 2033. Specifically, the total DUE growth by land use, calculated in **Table 6**, is divided by the capital project costs (see **Table 7**) to obtain total cost per DUE. This calculation is summarized in **Table 10**.

Table 8 RTIF Project Cost Per DUE

RTIF Project	Total RTIF Project Cost a (see Table 7)	RTIF Cost Allocation b (see Table 9)	RTIF Costs c = a * b	Maximum Fee / DUE = c / Total DUE growth, or 29,196
#1 - Jepson Parkway	\$208,100,000	58%	\$122,779,000	
#2 - Peabody Road	\$5,000,000	78%	\$3,900,000	
#3 - SR 12/Pennsylvania Avenue	\$50,000,000	71%	\$35,500,000	
#4 - SR 12/Church Road Fairgrounds Dr.	\$10,410,000 \$65,000,000	35% 32%	\$3,643,500 \$20,800,000	
#6 - Benicia Industrial Park Access	\$20,000,000	77%	\$15,400,000	
#7 - Columbus Parkway	\$1,000,000	92%	\$920,000	
#8 - North Connector	\$37,990,000	60%	\$22,794,000	
#9 - SR 113 Improvements	\$4,990,000	41%	\$2,045,900	
#10 County Rd. Projects ¹	\$12,626,431	17%	\$2,189,726	
#11 Regional Transit Project ¹	\$12,626,431	17%	\$2,189,726	
Total / Weighted Avg.	\$427,742,862	54%	\$232,161,851	\$7,952

[1] Calculated based on 5% percent of total DUE revenue assuming a fee of \$1,500 / DUE. Cost allocation assumed to equal 17% of total project costs, or the percent increase in County DUEs from 2013 - 33.

A summary of the maximum RTIF per DUE by land use is provided in **Table 11**. The actual fees by land use category are derived based on the DUE factors shown in **Table 5** (total fee per DUE multiplied by the DUE factor by land use category). As noted, the RTIF provides a single fee representing the entire County. To the extent that the costs are reduced because of outside funding sources, changed facility requirements, or reduced DUE growth, the fee would be reduced by a proportionate amount.

Table 9 Maximum Allowable Fee by Land Use Category

Fee Category	Unit Type	Pk Hour	% New	DUE	Fee / Unit = c * \$7,952 (see Table 10)
		Trip Rate ¹	Trips ²	Calculation	
		a	b	c = a * b	
Residential					
Single Family Residential (SFR)	/ Unit	1.00	100%	1.00	\$7,952
Multi Family Residential (MFR)	/ Unit	0.62	100%	0.62	\$4,930
2nd SFR Unit/Accessory Unit	/ Unit	0.54	100%	0.54	\$4,268
MFR Senior/Retirement Housing	/ Unit	0.39	100%	0.39	\$3,101
Non-residential					
Retail/Commercial	/ 1,000 Sq.Ft.	3.71	50%	1.86	\$14,750
Service Commercial	/ 1,000 Sq.Ft.	9.02	51%	4.60	\$36,580
Assembly Uses	/ 1,000 Sq.Ft.	0.55	64%	0.35	\$2,799
General/Medical Office	/ 1,000 Sq.Ft.	1.49	77%	1.15	\$9,123
Hotels/Motels	/ Room	0.605	58%	0.35	\$2,790
Industrial	/ 1,000 Sq.Ft.	0.88	85%	0.75	\$5,948
Warehouse/Distribution	/ 1,000 Sq.Ft.	0.16	85%	0.14	\$1,081
Institutional					
Health Care Facility	/ 1,000 Sq.Ft.	1.16	73%	0.85	\$6,734
Congregate Care Facility	/ Unit	0.20	100%	0.20	\$1,590
Private School/Day Care Facility	/ 1,000 Sq.Ft.	11.59	43%	4.93	\$39,168
Agricultural Uses					
Riding Arena ³	/ Acre	1.50	64%	0.96	\$7,634
Barn	/ 1,000 Sq.Ft.	0.16	80%	0.13	\$1,018

[1] Reflects average number of trips at peak hour of day for the unit type indicated based on data from the Institute of Transportation Engineers (ETI)

[2] Discount to peak trip rate to account for pass-through or loaded trips.

[3] If a barn is included in the development than that portion of the project is charged separately based on the rate shown for "Barn".



APPENDIX A:
Project-Specific Trip Percentage
Documentation

#	Agency	Location/ Title	Description	Baseline (2013) Trips			Baseline (2013) Trip Percentages		Growth in Trips to 2033			Growth Trip Percentages		Total 2033 Trips			Total 2033 Trip Percentages	
				Non-Regional	Regional	Total	Non-Regional	Regional	Non-Regional	Regional	Total	Non-Regional	Regional	Non-Regional	Regional	Total	Non-Regional	Regional
1	Fairfield/Vacaville	#1 - Jepson Parkway	Remaining segments of Jepson Parkway in Fairfield and Vacaville	91	210	301	30.2%	69.8%	120	176	296	40.6%	59.4%	211	386	597	35.4%	64.6%
2	Fairfield	#2 - Peabody Road	Widen Peabody Road from 2 to 4 lanes	153	632	785	19.5%	80.5%	101	358	459	22.0%	78.0%	253	990	1243	20.4%	79.6%
3	Suisun City/Fairfield	#3 - SR 12 and Pennsylvania Avenue Interchange	Replace the existing SR 12/Pennsylvania at-grade intersection with a new grade-separated interchange.	70	185	254	27.4%	72.6%	39	94	133	29.0%	71.0%	108	279	387	27.9%	72.1%
4	Rio Vista/Solano County	#4 - SR 12/Church Road Intersection	Improve the SR 12 and Church Road intersection.	307	134	441	69.5%	30.5%	362	193	555	65.2%	34.8%	668	328	996	67.1%	32.9%
5	Vallejo	#5 - SR 37/Redwood Parkway/Fairgrounds Drive	Improve Fairgrounds Drive and Redwood Parkway, including the SR37/Fairgrounds Drive and I-80/Redwood Parkway.	275	193	468	58.8%	41.2%	253	121	374	67.6%	32.4%	528	314	842	62.7%	37.3%
6	Benicia	#6 - Industrial Park Access Improvements	Reconfigure the Park/Bayshore and Park/Industrial split interchange, and the I-680/Lake Herman Road interchange, to add traffic signals, improve sight distance and better accommodate truck movements	38	145	183	20.9%	79.1%	36	122	159	22.9%	77.1%	75	267	342	21.8%	78.2%
7	Benicia	#7 - Columbus Parkway Improvements	Add westbound approach at Rose Drive, and add traffic signal at Rose/Columbus Parkway.	22	536	557	3.9%	96.1%	16	173	189	8.4%	91.6%	37	709	746	5.0%	95.0%
8	Fairfield/Solano County	#8 - North Connector West	Construct a 2-lane roadway connecting Business Center Drive to SR 12 Jameson Canyon.	141	234	374	37.6%	62.4%	88	133	221	39.6%	60.4%	228	367	595	38.3%	61.7%
9	Dixon/Solano County	#9 - SR 113 Improvements	ITS enhancements to improve safety through advanced curve warning signs, speed feedback and fog detection signs, and potential construction of a park-n-ride facility.	66	96	162	40.8%	59.2%	98	68	166	58.9%	41.1%	164	164	328	50.0%	50.0%