Value Capture: Making the Business and Economic Case

A Primer



Primer

Every Day Counts
Innovation Initiative
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On-Ramp to Innovation
every day counts

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This primer demonstrates how local and regional agencies tasked with providing transportation infrastructure can make the business and economic (B/E) case for using one or more value capture (VC) techniques to address funding challenges. The primer starts with an overview of the overall VC implementation life cycle and identifies the appropriate timing for making the B/E case. It also discusses the basic building blocks necessary for developing the B/E case. For select prevalent VC techniques, the primer provides comparative qualitative assessments based on the key metrics and evaluation criteria. An important element in making the B/E case is determining the magnitude of potential VC revenues that could be allocated to infrastructure purposes. Using ample case studies, this primer provides detailed, step-by-step quantitative assessments to estimate such VC revenue potential. Finally, the primer discusses the relevance of making the B/E case for VC in different project contexts.</td></tr>
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FOREWORD

State and local governments often struggle to mobilize the necessary funds to maintain, rebuild, and expand their local transportation networks. Planned projects often face funding hurdles that may result in projects being delayed or cancelled altogether, leaving important safety and mobility objectives unmet.

Value capture (VC) refers to a set of techniques that allow monetizing the appreciation in real property values that is triggered by infrastructure improvements. Such monetization enables the generation of future revenues that can be leveraged up front to help finance current or future infrastructure improvements. Under the right circumstances, this may allow practitioners to close funding gaps and accelerate project delivery, as well as trigger much needed economic development to provide livable communities, create jobs, and improve environmental conditions.

To maximize VC monetization potential, an effective VC strategy is to start early during project planning and public involvement phases and well in advance of right-of-way acquisition and project procurement. Making the VC business case is thus about developing a strategy to strengthen and preserve agencies' VC negotiating leverage with developers early in the planning stage. This primer demonstrates how local and regional agencies tasked with providing infrastructure can make the business and economic (B/E) case for using one or more VC techniques to address increasing funding challenges.

This primer is based on literature reviews, interviews, case studies, and lessons learned from practicing agencies. It introduces qualitative and quantitative approaches to developing the B/E case for select VC techniques and how these techniques could be integrated to maximize the VC potential. It also provides a specific case example to illustrate the integrated approach to making VC B/E case along a major corridor or at system level.

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LIST OF ACRONYMS AND ABBREVIATIONS

AP P3	availability payment public-private partnership
AV	assessed value
BAD	benefits assessment district
B/E	business/economic
BID	business improvement district
BRT	bus rapid transit
CBA	community benefits agreement
CBD	central business district
CDA	comprehensive development agreement
CFD	community facilities district
CID	community improvement district
CIP	capital improvement program
CTOD	Center for Transit-Oriented Development
DA	development agreement
DIF	developer impact fee
DOT	Department of Transportation
DU	dwelling unit
EIFD	enhanced infrastructure financing district
FAR	floor area ratio
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	greenhouse gas
GP	general plan
HH	household
HRT	heavy rail transit
IDC	intersection development charge
ITE	Institute of Transportation Engineers
JDA	joint development agreement
LACMTA	Los Angeles County Metropolitan Transportation Authority (“LA Metro”)
LAX	Los Angeles International Airport

LID	local improvement district
LRT	light rail transit
MPC-SP	Metropolitan Planning Council—St. Paul
MPO	metropolitan planning organization
NPV	net present value
OA	opportunity area
P3	public-private partnership
PH	peak hour
PPIC	Public Policy Institute of California
PSRC	Puget Sound Regional Council
RIF	road impact fee
ROW	right of way
RR P3	revenue risk public-private partnership
SAD	special assessment district
SDC	system development charge
SF	square feet
SP	specific plan
SSA	special service area
TAD	tax allocation district
TDD	transportation development district
TDR	transfer of development right
TID	transportation improvement district
TIF	tax increment financing; traffic impact fee
TOD	transit-oriented development
TRA	tax rate area
TRZ	transportation reinvestment zone
TUF	transportation utility fee
URA	urban renewal area
VC	value capture
VMT	vehicle-miles traveled

EXECUTIVE SUMMARY

Value capture (VC) is derived from real estate developments. Making the business and economic case for value capture to generate new funding for transportation infrastructure projects and programs is ultimately about establishing a clear and direct nexus between the transportation projects and the real estate developments that emerge or benefit from those projects.

Many local and regional agencies find that to maximize VC monetization potential, an effective strategy is to start early during project planning and public involvement phases and well in advance of right-of-way (ROW) acquisition and project procurement. Making the VC business case is also about developing a strategy to strengthen and preserve agencies' VC negotiating leverage with developers early in the planning stage.

Chapter 1: Introduction

The **basic goal of this primer** is to demonstrate how local and regional agencies tasked with providing infrastructure can make the business and economic (B/E) case for using one or more VC techniques to address funding challenges.

Chapter 2: Value Capture Implementation Process

The overall **VC implementation life cycle** broadly entails the following phases: feasibility/evaluation, preparation, formation (institutional), financing, life-cycle administration, and stakeholder coordination. The B/E case can be made early in the feasibility/evaluation phase to help make decisions on whether to proceed with one or more VC techniques. At that point, the assessment would be more qualitative in nature. A more detailed quantitative assessment can be performed in subsequent phases, in particular to provide input in developing the overall VC financing plan.

Chapter 3: Business/Economic Case Building Blocks

The necessary **building blocks** for developing the B/E case include:

- *Clear policy objectives* for using VC relevant to local/regional governments, State departments of transportation (State DOTs), metropolitan planning organizations (MPOs), regional transit authorities, and other infrastructure providers, including rural planning organizations and Tribal governments
- *Potential VC opportunity areas (OAs)* defined in terms of geographic boundaries, VC propensity factor, and buildout scenarios for potential real estate developments
- *Overall VC typology and VC techniques* available for implementation in different project contexts, e.g., mode type, location (urban vs. rural), project size, etc.
- *Relevant stakeholders*, including various government agencies, those who directly benefit from and pay for VC (e.g., taxpayers, property owners, tenants, developers), and others as called for by specific VC regulatory requirements
- *Set of key evaluation criteria* for assessing the relative merits of different VC techniques
- *Overall framework* for developing an optimal and integrated VC strategy, including equity and risk considerations

Chapter 4: Qualitative Assessments

Comparative qualitative assessments are performed on select VC techniques—e.g., tax increment financing (TIF), special assessment districts (SAD), developer impact fees (DIF), and joint development and ROW use agreements—based on **key evaluation criteria** identified in Chapter 3. These criteria include:

- *Yield/revenue potential:* (a) ability to generate VC revenues within the desired or reasonable timeframe, (b) stability of such revenue stream, and (c) flexibility in financing a wide range of public improvements
- *Equity*: (a) financial equity as considered reasonably fair by those who receive the VC benefits and bear the VC financial burden and (b) social equity in terms of the ability to pay the VC financial burden and provisions for those who cannot pay
- *Efficiency*: (a) magnitude of benefits derived from VC financing mechanisms and (b) extent to which the VC mechanisms are based on direct usage, i.e., those who benefit should pay in direct proportion to the benefits they receive
- *Administrative ease*: (a) relative ease of administrative processes (e.g., fee collection) and (b) cost-effectiveness of district formation, collection of revenues, and overall administration of specific VC techniques
- *Transparency*: whether the method used to determine the VC benefits and financial burden is (a) visible to the general population and (b) easy to understand
- *Political/legal feasibility*: whether there are any known potential political or legal obstacles to VC implementation
- *Policy goals*: whether the end outcome specific to a VC technique is consistent with the overall policy goals of the local jurisdictions and, as relevant, the policy goals of State DOTs, MPOs, and/or regional transit agencies

Chapter 5: Quantitative Assessments

When the main VC driver is a major transportation corridor project where real estate developments along the corridor are open-ended, the quantitative assessments can help determine the ***maximum*** **VC potential** that could support funding for both the corridor project and local improvements directly linked to potential real estate development projects along the corridor. In this chapter, the three most common techniques—TIF, SAD, and DIF—are considered for quantitative assessments.

The basic steps in the quantitative assessment are:

- Defining VC OAs and developing buildout scenarios for the OAs
- Estimating the basis for VC revenues relevant to each VC technique (e.g., incremental assessed value [AV] for TIF and SAD and incremental trip generation for DIF)
- Estimating VC revenue potential for viable VC techniques for the buildout scenarios, including developing cash flows over the VC life cycle
- Estimating corridor- or system-level VC revenue potential by integrating the cash flows across all OAs

These steps are not required under Federal law; value capture techniques are generally implemented under State or local law. To illustrate these steps, the following paragraphs walk through a quantitative assessment for a single node—i.e., a regional shopping mall project at a single highway intersection or transit-oriented developments (TODs) at a single transit station.

Defining the VC OAs for a single node entails identifying areas along the transportation corridor where substantive new developments could occur—e.g., major highway intersections or transit stations with high growth potential ("OA nodes"). Local general plans (GPs) and specific plans (SPs) at these OA nodes generally help in defining the geographic extent ("VC catchment area") of the OA node and the intensity of development ("VC propensity") based on the growth plans and maximum allowable densities that are coded into land use/zoning plans. **Developing buildout scenarios** involves converting the current land use into higher-density uses based on the maximum increase in density allowed by local land use/zoning plans. Parcel-level data for the VC catchment area is needed to establish the existing conditions for the base case upon which incremental developments could be added to reach the buildout potential.

The **basis for estimating VC revenues** varies depending on the VC technique used. For TIF and SAD, the VC revenues are from taxes (whether *ad valorem* or special taxes requiring voter approval) derived from incremental AV of properties. For DIF, the revenues are from fees (generally no voter approval required) derived from the increase in number of trips generated by different land uses. Estimating **incremental AVs** entails translating the incremental commercial and residential developments associated with the buildout scenario into the incremental AVs based on higher projected unit pricing for each use. Estimating **incremental trip generation** is based on trip generation rates by land use that are used by local governments in developing their local DIF schedules. More local governments are now choosing to legislate their impact fee structures based on comprehensive nexus studies performed on their GPs and SPs. Where DIF uses are allowed, standard DIF schedules by land use and DIF-specific trip generations rates are publicly available for most local governments.

Estimating VC revenue potential for TIF and SAD involves estimating incremental tax revenues—i.e., increased taxes over a baseline, whether from new development or enhanced property values—that could be generated under the buildout scenario based on the incremental AVs estimated above. These revenues are generally under the discretion of the counties and cities that are included within the VC catchment area. The more difficult challenge for these tax-based VC techniques is determining what portion of these new revenues the affected counties and cities are willing to allocate for transportation corridor projects that extend beyond their jurisdictions. For TIF and SAD, the VC revenues are value based and market dependent, and there is a strong "but-for" rationale[1] to attribute the incremental value to transportation corridor investments.

Estimating VC revenue potential for DIF involves applying the DIF fee schedule by land use (e.g., fee per dwelling unit for residential and per square foot [SF] for commercial) to incremental developments by use for the buildout scenario (e.g., increase in number of dwelling units and square footage, respectively, for residential and commercial uses). The main challenges for these fee-based techniques are twofold: (1) many local governments may not have formal fee structures or schedules that can be applied easily and (2) where there are formal fee schedules, they are based specifically on local capital improvement programs (CIPs). For DIF, the VC revenues are cost based where the fees are linked directly to the local CIPs that generally do not include capital projects outside the local jurisdictions. For this reason, it may be

[1] The recognition that real estate developments (and the resulting substantial increase in local tax revenues) would not be possible but for the core infrastructure project.

more challenging to estimate DIF-related revenue potential for open-ended cases without a significant shift in current practices and additional nexus study efforts on the part of local governments.

The final step in the quantitative assessment is to **develop a long-term cash flow** both to get the full life-cycle picture of the VC revenue potential and to estimate potential VC bonding capacity. This step requires basic assumptions about (1) the timeframe of the VC revenue collection; (2) the timeframe for the buildout, i.e., market absorption period; (3) the statutory property value appreciation rate allowed for existing properties; (4) the average turnover rate on existing properties; and (5) the discount rate for net present value (NPV) analysis.

The quantitative assessment described above is for a single node, which is a useful exercise for the local jurisdictions in which the node is located. Similar assessments can be made at multiple nodes to determine the VC potential at corridor and/or system levels. These broader assessments are useful for Federal, State, and/or other regional agencies (e.g., MPOs, regional transit authorities) that are involved with major infrastructure projects across multiple jurisdictions.

Chapter 6: Making the Business/Economic Case in Different Project Contexts

When the main VC driver is a **major real estate development** project, as is often the case, making the B/E case for VC is mostly about determining specific public improvements needed to support the specific land use programming called for in the real estate project. The cost of these improvements determines the level of funding that must be generated by using one or more VC techniques.

When the main VC driver is a **core infrastructure** project (such as a new highway or transit corridor), making the B/E case for VC is essentially about establishing the direct nexus between the core infrastructure project and any major real estate developments that are triggered by the project (such as a regional shopping mall at a major highway intersection or TODs at a centrally located transit station). The rationale for the direct nexus is on “but-for” grounds—the recognition that real estate developments (and the resulting substantial increase in local tax revenues) would not occur without the core infrastructure project.

Though separate and distinct, a VC approach can play an important role when **public-private partnership (P3)** models are used to deliver and finance core infrastructure projects. When a P3 project is based on an availability payment (AP) P3 model with a significant real estate development component within its scope, VC techniques may be used in the real estate component to generate additional funding (revenue) sources to support the infrastructure component. Administered by the P3 public sponsor, the VC revenues thus generated can help defray the sponsor’s P3 availability payment obligations.

Concluding Remarks

To date, the use of VC techniques to pay for core infrastructure projects has been limited. However, VC is becoming increasingly critical to generate alternative funding sources locally to complement traditional Federal and State funding sources. For critical core infrastructure projects with lasting positive impacts in local communities around the United States, an overall approach to VC that is more expansive, innovative, and, at times, precedent setting could help local and regional governments facing increasingly significant infrastructure funding challenges. This primer provides the basis for making the B/E case for using VC techniques for the benefit of public agencies that are responsible for critical infrastructure provisions and that are facing these funding challenges.

CHAPTER 1: INTRODUCTION

1.1 Goals and Objectives of this Primer

Value capture (VC) enables the monetization of the appreciation in real property values triggered by infrastructure improvements. This monetization generates future revenues that can be leveraged up front to secure infrastructure financing, thus triggering the value appreciation cycle. Although infrastructure is a critical element, VC revenues are generally derived from real estate projects and not from infrastructure projects.

The use of VC tools can be triggered by either (1) major real estate development projects that require additional public infrastructure capacity (e.g., local roads) or (2) core infrastructure projects (e.g., improved highway corridor or transit corridor extension) that encourage real estate development projects along the corridor. In both cases, value capture is directly linked to the real estate component, and the revenues are captured for purposes of funding the infrastructure component.

Historically, VC techniques have been used primarily in the context of major real estate development projects. Currently, however, the need for VC is becoming more critical in the context of core infrastructure projects so that alternative funding sources can be identified locally to supplement more traditional Federal and State funding sources.[2] In general, VC techniques are directly or indirectly linked to land use entitlements, and the revenues thus generated are under the control of local and regional governments. In this regard, for VC to be successful in the context of core infrastructure projects, it is essential for there to be buy-in from local and regional governments.

The goal of this primer is to provide basic information on making the business and economic (B/E) case for using one or more VC techniques. The primer is designed for local and regional governments and other public agencies—including State departments of transportation (State DOTs), metropolitan planning organizations (MPOs), regional transit authorities, rural planning organizations, Tribal governments, and other infrastructure providers—that are responsible for critical infrastructure provisions and that often face major funding challenges.

The primer starts with an overview of the overall VC implementation life cycle and identifies the appropriate timing for making the B/E case. It also discusses the basic building blocks necessary for developing the B/E case. For select prevalent VC techniques, the primer provides comparative qualitative assessments based on the key metrics and evaluation criteria. An important element in making the B/E case is determining the magnitude of potential VC revenues that could be allocated to infrastructure purposes. Using ample case studies, this primer provides detailed, step-by-step quantitative assessments to estimate such VC revenue potential. Finally, the primer discusses the relevance of making the B/E case for VC in different project contexts, whether real estate development, core infrastructure, or projects delivered using a public-private partnership (P3) model.

[2] In many cases, projects on local streets are ineligible for Federal and State funding.

1.2 Organization of this Primer

This primer is organized as follows:

Chapter 2 discusses when jurisdictions usually find it most appropriate to make the B/E case in the context of the overall VC implementation life cycle. Chapter 3 identifies basic building blocks in developing the B/E case, including key VC evaluation criteria. Chapter 4 provides comparative qualitative assessments for select VC techniques based on the evaluation criteria identified in Chapter 3. Chapter 5 provides the detailed quantitative assessment steps necessary to estimate VC revenue potential using real-world examples. The primer concludes with Chapter 6, which discusses the different project contexts for making the B/E case.

CHAPTER 2: VALUE CAPTURE IMPLEMENTATION PROCESS

2.1 Overall Value Capture Implementation Process

In making the business/economic (B/E) case for value capture (VC), it is useful at the outset to have a good understanding of the overall VC implementation process. This helps determine when it would be most beneficial to conduct the B/E case assessment. The process will differ depending on the specific VC technique under consideration and any institutional and regulatory requirements associated with the technique under State or local law.

Broadly speaking, the overall VC implementation life cycle for most VC techniques entails the following basic steps (see **Figure 1**[3]):

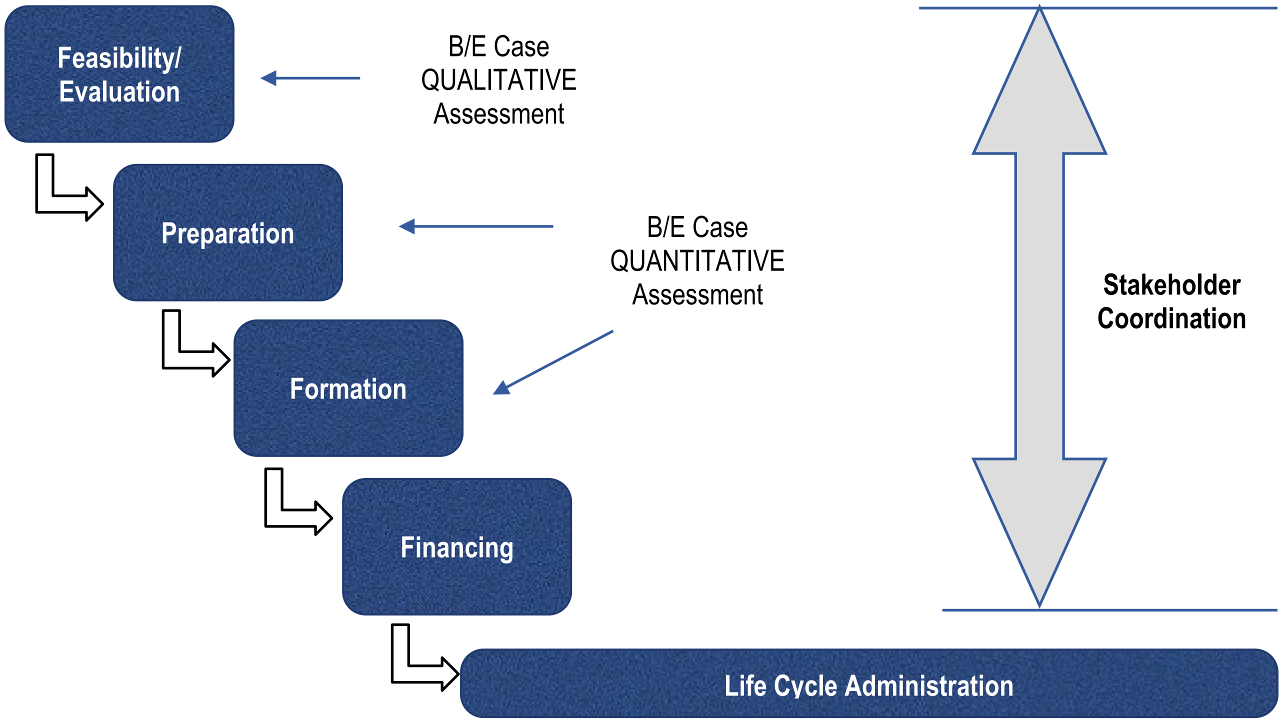
- **Stakeholder Coordination**—engage key stakeholders for VC buy-in and approval (throughout)
- **Feasibility/Evaluation**—assess VC potential and identify VC opportunity areas and key stakeholders
- **Preparation**—define relevant projects and project areas, secure internal support, develop VC implementation plan (including negotiating/leveraging strategy), and identify internal VC team
- **Formation (Institutional)**—establish a VC administrative body (e.g., tax increment financing [TIF] district, special assessment district [SAD]) that complies with institutional and regulatory requirements related to the specific VC technique chosen
- **Financing**—obtain final approval and issue VC revenue-backed bonds (e.g., TIF or SAD bonds)
- **Life-cycle Administration**—manage VC district and administer financial transactions

Ideally, B/E case assessments should be both qualitative and quantitative in nature. As indicated in **Figure 1**, the B/E case could be made early in the feasibility/evaluation stage when the assessment would be more qualitative in nature. Once the decision is made to proceed with one or more VC techniques, a more detailed quantitative assessment could be performed in subsequent stages to provide input to the VC implementation and financing plan.

In the current VC implementation climate, B/E case development is often not considered a prerequisite. Rather, it is used as an afterthought to justify the decisions that have already been made, or it is performed much later—e.g., as part of preparing a financing plan to assess a VC debt requirement—when it no longer serves as a decision-support tool. In general, B/E case assessments are best implemented as an integral part of the overall VC decision-making process, providing critical inputs to early decisions—including evaluating whether to pursue VC, selecting preferred VC techniques, communicating equity and benefits, building the foundation for leveraging negotiations, and preparing a public involvement and transparency plan.

[3] Unless otherwise indicated, figures and tables without sources were prepared specifically for this primer.

Figure 1. Illustration. Overall VC implementation process and B/E case assessment timing.



2.2 Detailed Implementation Process—Special Assessment District Example

Because the VC implementation process can be substantially different from one technique to another, it is beneficial to look at the details of at least one technique to gain a better understanding. **Figure 2** provides an example of the process involved in implementing a community facilities district (CFD), a common form of special assessment district (SAD) used in California.[4] The diagram illustrates the level of complexity involved in SAD implementation in general. Because most VC techniques—especially those that are government-sponsored such as SAD and tax increment financing (TIF)—likely involve issuing tax-exempt debt backed by the government, the process can be quite rigorous, with multiple layers of regulatory and institutional requirements. The implementation steps depicted in **Figure 2** detail this.

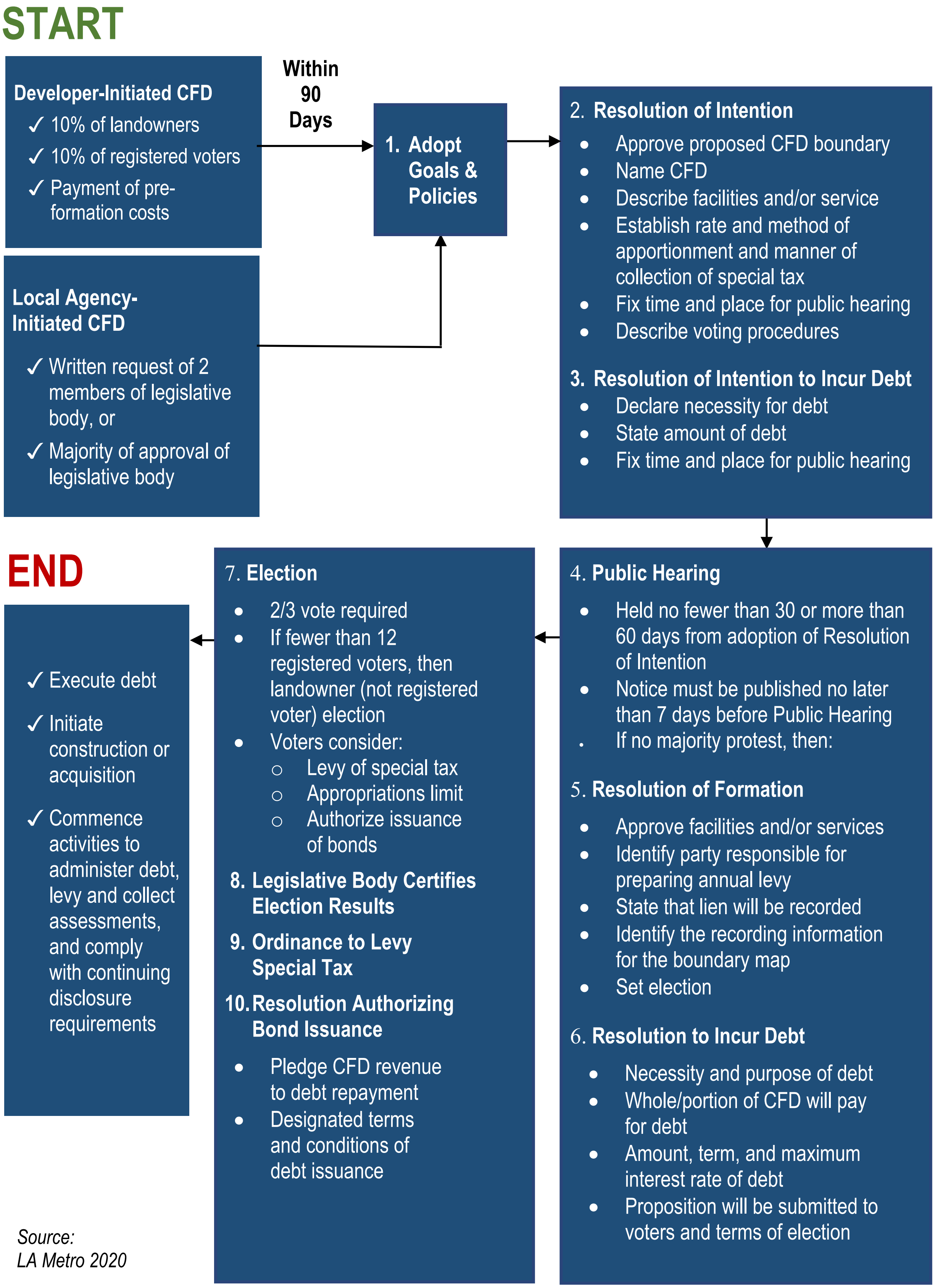
The B/E case assessment may be either qualitative or quantitative in nature, depending on when and how it is used. For example, a qualitative B/E case assessment could be performed early as part of the planning process when the feasibility of various VC techniques is evaluated to help select the preferred technique(s). This can serve as critical input in establishing the local government's goals and policies for

[4] In California, the Mello-Roos Community Facilities Act of 1982 (Government Code 53311-53368.3) established community facility districts (CFDs) to be used for new developments, where their formation can be initiated by either a local agency or one or more developers/landowners. CFDs allow issuing of tax-exempt bonds (called CFD bonds) to raise funding for public improvements needed on private development projects. The bonds are backed by the new assessments to be imposed on future property owners (buyers) once the development project is complete. Issuing CFD bonds enables upfront funding of the improvements needed on the project.

the chosen technique(s) and help kick-start the implementation process (at “Start” and Step 1 in **Figure 2**). In addition, a qualitative assessment will also help identify stakeholder concerns to facilitate the public hearing process (at Step 4 in **Figure 2**).

A quantitative B/E case assessment, on the other hand, provides critical knowledge regarding the magnitude of potential VC revenues. This can offer important input to decisions regarding the geographic area to be covered, public improvements to be included, and the nature of the VC-related debt to be issued (at Steps 2, 3, and 6 in **Figure 2**).

Figure 2. Chart. Detailed VC implementation steps—CFD example in California



Source: LA Metro 2020

CHAPTER 3: BUSINESS/ECONOMIC CASE BUILDING BLOCKS

3.1 Value Capture Goals and Objectives

Value capture (VC) is about monetizing the appreciation in real property values triggered by infrastructure improvements. Although infrastructure is a critical element, VC revenues are generally derived from real estate projects, not infrastructure projects. As it relates to transportation infrastructure, the use of VC can be triggered by either (1) major real estate development projects that require additional local transportation capacity or (2) major transportation corridor projects that induce real estate developments along the corridor (e.g., regional shopping malls at major highway intersections, transit-oriented developments [TODs] at centrally located transit stations). In these cases, VC is directly linked to real estate developments, and the local jurisdictions where the developments are to occur would have the primary responsibility for implementing appropriate VC techniques—and, for that matter, making the business/economic (B/E) case.

The basic objective of using one or more VC techniques is first and foremost about generating new funding sources to:

- Pay for ancillary transportation and other public improvement needs directly linked to major real estate development projects
- Provide local contributions to major transportation corridor and other core infrastructure projects, especially when Federal, State, and other traditional funding sources are insufficient[5]

Beyond generating new revenues, the use of VC techniques can also help local jurisdictions in meeting their overall policy goals established in their general plans (GPs).[6] These GPs are designed to guide the development projects to help meet the local long-term economic growth/development, land use/zoning, and transportation/mobility goals. For local governments, a VC approach can therefore offer an opportunity to better enforce policy goals through the development projects, which could include, for example:

- Creating more and better jobs
- Providing more housing, including multifamily and affordable housing units
- Promoting smart growth, including TODs around light rail stations
- Improving local and regional transportation connections
- Providing more open space and parks, including trails, bike paths, and other amenities
- Promoting balanced economic growth and development

For major transportation corridor projects with wider regional impacts, the overall VC approach could be broadened at the corridor level beyond a “single node” undertaking (i.e., at an intersection or a station) and involve multiple jurisdictions. At the corridor level, for example, the B/E case for VC could be made by transportation agencies to encourage the use of VC techniques to generate new local revenues. The

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[5] Local contributions in this case can increase the probability that infrastructure projects that directly benefit the local communities will proceed as planned and that the project will be completed on time to kick-start real estate development projects.

[6] Also referred to as comprehensive plans or master plans.

revenues from multiple jurisdictions along the corridor could help pay for the corridor itself, which in turn could help trigger major real estate developments at multiple nodes along the corridor. The VC goals and objectives under these cases also have the potential to reflect the overall policy goals of State departments of transportation (DOTs), metropolitan planning organizations (MPOs), and/or transit agencies, as relevant.

For a major regional transit corridor, for example, the local jurisdictions' VC approach to TODs at individual stations would be aligned with those of the regional transit agency. The transit agency's goals would generally be much broader, reflecting the basic "three E's"—economy, ecology, and equity—including smart growth (i.e., high-density developments to achieve economic efficiency), affordable housing (i.e., provisions for low-income households for social equity), and greenhouse gas (GHG) reduction (i.e., climate resiliency through environmental responsiveness).

In short, for VC to be successful, it is beneficial to have clearly articulated policy goals at the outset with broad stakeholder buy-in. The VC techniques pursued subsequently should be directly linked to achieving these goals.

3.2 Value Capture Opportunity Areas and Buildout Scenarios

When the main VC driver is a major real estate development project, the B/E case for VC is largely dictated by the project-specific real estate programming, the resulting project economics, and the nature of the agreement between the developer and the local agency (which can be influenced by the local economic and political climate). When the main driver is a major transportation corridor project, where the developments along the corridor are either under planning or yet to be contemplated, making the B/E case for VC becomes much more open ended. In this case, the need for a B/E case assessment could be more critical, because it could help gain better understanding of the feasibility and nature of future developments (and thus the VC potential) along the corridor. The focus in this section and throughout this primer is therefore more on the open-ended case. The basic concepts presented are still relevant for cases where development projects are well defined.

For transportation corridor projects, VC opportunity areas (OAs) are typically represented by major nodes along the corridor (e.g., major highway intersections, passenger or freight terminals or stations) where substantive real estate developments are most likely to occur. A regional shopping mall at a major freeway intersection or high-density TODs at a centrally located transit station are good examples of real estate projects where substantive VC opportunities could exist.

Where VC needs are open ended, defining VC OAs for a given node entails three main factors:

- *Geographical boundary* of the node (referred to as the VC catchment area) where various VC techniques could be implemented—e.g., the area within a shopping mall project boundary, the area surrounding an agricultural or industrial complex, or a predefined area around a transit station
- *Locational characteristics* of the node—e.g., urban vs. rural, high- vs. low-growth areas, commuter concentration within the node—which reflects relative propensity for VC potential (referred to as the VC propensity factor)
- *Site- or project-specific buildout potential*, which is be determined by the maximum density allowed by local land use/zoning regulations associated with the node—e.g., maximum allowable density for residential and commercial uses (referred to as the VC buildout scenario).

These factors are important inputs to performing the quantitative assessments discussed later (see Chapter 5 and Appendix B).

3.3 Relevant Value Capture Techniques

There are many VC techniques currently available that could be applied in different project contexts. The more prevalent ones are:

- Tax increment financing (TIF) (and many variations thereof)
- Special assessment districts (SAD) (and many variations thereof)
- Developer impact fees (DIF) (and many variations thereof)
- Negotiated developer exactions/contributions, such as land dedication and/or in-kind provisions
- Transportation utility fees (TUF)
- Contract-based VC techniques
  - Development agreement (DA)
  - Community benefits agreement (CBA)
  - Public asset/right-of-way (ROW) use agreement
  - Joint development agreement (JDA)
- Zoning incentives (density bonus, transfer of development rights [TDR], etc.)[7]

[7] These incentives are often part of negotiated exactions.

Table 1[8] provides a brief description of these techniques.[9] Especially for TIF, SAD, and DIF, there are also many different variations, which are called by different names in different States. To minimize confusion, the following table (**Table 2**) provides representative examples of these variations and alternative names:

Table 1. Summary of VC techniques.

VC Technique	Description
Tax Increment Financing (TIF)	Based on existing *ad valorem* tax, TIF captures organic and incremental increases in property values and taxes resulting from public improvements within a designated TIF district (no new tax assessment involved).
Special Assessment District (SAD) Financing	Property and business owners/tenants within a designated SAD are subject to new tax surcharges (not *ad valorem*) to pay for public improvements and services within the SAD.
Developer Impact Fees	Developers pay in-lieu fees to account for the cost of any incremental public improvement or service capacity necessitated by their development projects.
Negotiated Exactions	Developers dedicate their land for public use or provide in-kind services or physical facilities for public benefit.
Transportation Utility Fees (TUF)	Fees typically associated with recurring maintenance and repair costs for local roads and transit networks that are allocated to properties within a given jurisdictional limit (can be used for capital improvements).
Development Agreement (DA)	Legally binding, long-term contract negotiated between developers and local governments in which developers provide large (sometimes upfront) contributions for public improvements in exchange for vested right, i.e., no change in land use/zoning for the term of the contract.
Community Benefits Agreement (CBA)	Often used in conjunction with DA, developers provide specific community benefits (i.e., job, social programs, affordable housing) in exchange for the communities' support.
Public Asset/Right-of-Way (ROW) Use Agreement	Involves the private use of public assets, public ROWs, and development rights above, below, and adjacent to public ROWs; examples include air rights (e.g., above expressway turnpikes), naming rights, advertisements, third-party franchise agreements (e.g., solar panels on public real estate).
Joint Development Agreement (JDA)	Involves local government directly partaking in the private development project by committing public assets and/or development rights above, below, and adjacent to public ROWs in exchange for various revenue/cost sharing arrangements.

[8] Unless otherwise indicated, the tables and figures without sources are prepared specifically for this primer.

[9] Additional details on these techniques can be found in the FHWA Value Capture Implementation Manual (FHWA-HIN-19-004, FHWA 2019).

VC Technique	Description
Zoning or Regulatory Incentives	Often used as a part of negotiated exactions; involves favorable zoning changes, such as up-zoning with density bonus for affordable housing provisions; transfer of development rights (TDR) to monetize latent rights; vested rights used in DA; etc.

Table 2. Variations and alternative names of VC techniques.

VC Category	Representative Examples of Variations/Alternative Names
Tax increment financing (TIF)	▪ Tax allocation district (TAD) (Georgia), transportation reinvestment zone (TRZ) (Texas), and urban renewal area (URA) (Oregon)
Special assessment district (SAD)	▪ Many States use benefits assessment district (BAD) (generic), business or community or local improvement district (BID/CID/LID), transportation development district (TDD), or transportation improvement district (TID) ▪ State-specific examples include community facilities district (CFD) (California) and special service area (SSA) (Illinois)
Developer impact fees (DIF)	▪ Other common terms in the transportation sector are mobility fee, intersection development charge (IDC), road or traffic impact fee (RIF/TIF), and system development charge (SDC)

The choice of a particular VC technique should reflect the context in which it is applied. **Table 3** provides a summary of the type of VC techniques used on more than 70 transportation project examples in the United States.[10] Context includes: (1) type of mode (i.e., local roads, highways, or transit), (2) locational settings (i.e., urban vs. suburban), (3) project size (small, medium, large), and (4) VC revenues as a percentage of total project cost. As shown, in most cases, projects used more than one VC technique and there appears to be no particular consistency in the selection of VC techniques for a given project context (see Appendix A for additional details). More generally, the selection of a particular VC technique is often based on the most expedient and available option at the time.

Section 3.5 provides qualitative VC evaluation criteria that can be used to compare different VC techniques. These criteria can assist in selecting specific VC techniques for specific project contexts.

[10] These project examples are from the U.S. Department of Transportation's Center for Innovative Finance Support (Value Capture Project Profile) (https://www.fhwa.dot.gov/ipd/value_capture/project_profiles/).

Table 3. VC techniques for different project contexts—representative examples.

Mode	Location	Project Size*	VC % of Project Funding	VC Tool Category					
				TIF	SAD	Impact Fees	Other Developer-Based	ROW Use Rights	Others
Local Roads	Urban	S	100%				✓	✓	
		M	100%	✓	✓		✓		
		L	100%	✓	✓	✓	✓	✓	
	Suburban/ Rural	S	60–100%	✓	✓	✓			
		L	50–100%	✓	✓	✓		✓	✓
Highways/ Bridges	Urban	M	100%	✓	✓				✓
		L	1–60%		✓				✓
	Suburban/ Rural	S	80%	✓	✓	✓	✓		
		M	10–45%	✓	✓	✓			
		L	1–90%	✓	✓		✓		✓
Toll Roads	Urban	L	100%						✓
	Suburban/ Rural	M	30%				✓		
		L	2–100%			✓			✓
Transit/ Multi-modal	Urban	M	35–50%	✓	✓		✓	✓	✓
		L	2–100%	✓	✓		✓	✓	✓
	Suburban/ Rural	L	5–40%		✓				✓

** S (small)—less than $50M; M (medium)—between $50M and $250M; L (large)—over $250M.*

3.4 Stakeholder Identification

There are many stakeholders in VC implementation. In addition to local governments that are responsible for implementing the various VC techniques chosen, other public entities such as State DOTs, MPOs, public transit agencies, and rural planning organizations have a stake in the successful VC outcome. Most importantly, the key VC stakeholders are those who benefit directly from property value appreciations and public improvements linked to VC, and who ultimately bear the financial burden to contribute to the VC revenue funding sources. VC stakeholders also vary depending on the specific VC techniques used.

Table 4 identifies, for each VC technique, examples of key stakeholders that have primary responsibility for bearing the VC financial burden. Identifying key stakeholders should also be directly tied to relevant regulatory and institutional requirements specific to each VC technique. Finally, as relevant, lenders and members of the investment community that cater to real estate or infrastructure projects (whether publicly or privately financed) may also have a stake in how different VC approaches could impact the overall project economics.

Table 4. Key stakeholders by VC techniques.

VC Technique	Key Stakeholder with Financial/Contractual/Regulatory Responsibility				
	Taxpayers (General Tax Base)	Property or Business Owners or Tenants	Developers	Local Jurisdictions	Private Entities or Corporate Sponsors
Tax Increment Financing (TIF)	✔				
Special Assessment District (SAD)		✔			
Developer Impact Fees			✔		
Negotiated Exactions			✔		
Transportation Utility Fees (TUF)		✔			
Development Agreement (DA)			✔	✔	
Community Benefits Agreement (CBA)		✔	✔		
Public Asset/ROW Use Agreement				✔	✔
Joint Development Agreement (JDA)			✔	✔	
Zoning/Regulatory Incentives			✔	✔	

3.5 Value Capture Evaluation Criteria

In developing the overall VC approach, establishing a set of criteria for evaluating the effectiveness of various VC techniques enables direct comparisons among the techniques. Strathman and Simmons (2010) recommend VC evaluation criteria based on the principles of public finance theory, in which six key features are used to characterize an optimal tax regime (as described in Musgrave and Musgrave [1989]). These features are yield/revenue potential, equity, efficiency, administrative ease, transparency, and political/legal feasibility. This primer uses the same six criteria and adds macro-policy goals in evaluating the relative merits of different VC techniques. The following describes the resulting seven evaluation criteria:

1. Yield/revenue potential: (a) ability to generate VC revenues within the desired or reasonable timeframe, (b) stability of such revenue stream, and (c) flexibility in financing a wide range of public improvements
2. Equity: (a) financial equity as considered reasonably fair by those who receive VC benefits and bear the VC financial burden, and (b) social equity in terms of the ability to pay the VC financial burden and provisions for those who cannot pay
3. Efficiency: (a) magnitude of benefits derived from VC financing mechanism and (b) extent to which the VC mechanisms are based on direct usage, i.e., those who benefit should pay in direct proportion to the benefits they receive
4. Administrative ease: (a) relative ease of administrative processes (e.g., fee collection) and (b) cost-effectiveness of district formation and administration of specific VC techniques
5. Transparency: whether the method used to determine the VC benefits and financial burden are (a) visible to the general population and (b) easy to understand
6. Political/legal feasibility: whether there are any known potential political or legal obstacles to VC implementation (e.g., lack of enabling legislation)
7. Macro-policy goals: whether the outcome of the VC technique is consistent with the overall policy goals (e.g., job creation/retention, affordable housing) of the local jurisdictions and, as relevant, State DOTs, MPOs, and/or other agencies

These criteria form the primary basis for the qualitative assessments presented in Chapter 4.

3.6 Value Capture Risk Allocation and Phasing Strategy

Major lessons learned in past VC applications have been twofold. First, VC techniques are often applied too late, after property appreciation has already occurred. Second, existing properties next to new developments often enjoy windfall gains in property appreciation without paying their fair share of the new improvements. Best VC practice now is to start early, use as large a footprint as possible, and apply the VC techniques for a longer period.

Given these lessons, for a major transportation corridor project, an effective VC approach is to start early when there is a general recognition of the transportation project's potential to generate value, but before the land use entitlements for future developments along the corridor are granted without proper assessment of their monetization potential based on benefits and costs to each major stakeholder involved. The VC approach at the corridor level can be planned alongside the corridor project planning process, and well in advance of the project procurement and subsequent opening date, to maximize its potential.

Once ROW is acquired and a project is procured, for example, much of the negotiating leverage is lost and incentives for developers may be weakened. Generating and maximizing negotiation leverage in capturing value during the planning and public involvement phase is an important element in making and implementing the VC business case. Developing a strategy for strengthening and preserving negotiating leverage early in the planning stage also helps to reduce overall risk in VC monetization.

At a strategic level over the long run, the basic VC approach could be multilayered, starting with those techniques that have the least new impact—and thus lowest risks, real or perceived—on stakeholders (e.g., TIF with no new taxes) and followed by those involving new charges with increasing risks (e.g., SAD and/or developer impact fees) in a risk-adjusted manner so that each stakeholder can better bear the VC financial burden.

Developing an overall VC approach entails identifying which VC techniques will be used when and where, and how these techniques will be implemented. The VC approach addresses how multiple techniques could be integrated and phased over a project life cycle based on an underlying framework that considers: (1) the equity factor—i.e., those who benefit the most pay the most—and (2) the risk factor—i.e., those who bear the risk do so when they are best able.

For example, for transportation corridor projects, real estate developments (including TODs) along new or improved corridors can be further encouraged by incentivizing developers through the use of government-sponsored VC techniques first—e.g., a TIF district first followed by, as needed, SAD.[11] As the real estate project proceeds, the development risks decrease progressively, and developers' willingness to pay should increase accordingly with increasing levels of exactions/contributions. From the outset of the development project, with complete transparency, such an integrated and risk-adjusted VC implementation strategy could be established for the entire project life cycle to help streamline the VC implementation process. This is especially beneficial when multiple techniques and stakeholders are involved and when the VC implementation becomes quite complex with multiple layers of regulatory and institutional requirements.

[11] Assuming that the real estate projects considered are not speculative in nature but have a high degree of viability in terms of specific project economics and positive overall economic impacts on local communities.

CHAPTER 4: QUALITATIVE ASSESSMENTS

4.1 Key Qualitative Assessment Metrics

As mentioned in Section 3.5, there are seven key metrics to consider in the qualitative assessment when making the business/economic (B/E) case for value capture (VC):

- Yield/Revenue Potential
- Equity
- Efficiency
- Administrative Ease
- Transparency
- Political/Legal Feasibility
- Macro-policy Goals

Taken together, the above criteria help to determine the overall effectiveness of VC techniques and provide the basis of making apples-to-apples comparisons among different VC techniques. This section provides general assessments of common VC techniques with respect to these criteria in the context of major highway interchange projects.[12] It is beneficial to perform more detailed assessments when selecting VC techniques in specific project contexts.

4.2 Tax Increment Financing (TIF)[13]

Yield/Revenue Potential:

- Substantial but not necessarily predictable; depends on value dynamics of properties within a given TIF district as well as prioritization and share of the yield across competing demands and jurisdictions
- Sensitive to (a) pace of development, (b) tax base appreciation, (c) wider real estate market conditions; generally vulnerable to economic downturn
- Capable of providing larger revenue streams (assuming that the assessed values always remain below market values[14])

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[12] Refer to Strathman and Simmons (2010) for additional details pertaining to the assessments of specific VC techniques used in the State of Oregon.

[13] TIF assessments shown are for improvements within the TIF district and local jurisdictions. For projects outside the jurisdictions, such as a major highway or transit corridor, there needs to be buy-in from local governments to contribute the TIF revenues to the corridor project on "but-for" grounds—the recognition that real estate developments, and the resulting substantial increase in local tax revenues, would not be possible but for the core infrastructure project (see Chapter 5 and 6 for additional discussions).

[14] If assessed values are higher, property owners could be forced to pay taxes that are above their properties' worth in the marketplace, potentially making the collection of taxes more difficult and politically challenging.

Equity:

- Existing developments (as opposed to new developments) carry relatively greater burden than other VC mechanisms
- Potential diversion of tax increments for other competing special purposes
- May compete with similar developments (existing) that did not receive TIF cost-cutting benefits
- May create incentives for existing developments to move instead of creating new developments

Efficiency:

- Able to undertake coordinated planning of transportation improvements with an urban redevelopment plan
- Can facilitate high density developments (e.g., TODs)
- When used for major highway interchanges, provides opportunity to coordinate transportation and land use planning to improve efficiency of resources dedicated for transportation purposes

Administrative Ease:

- Most local governments have experience with TIF compared to other VC mechanisms (other than special assessment districts [SADs], which are also common).
- Requires technically skilled staff and tends to be procedure-laden with added administrative burden
- Relies on consultants if internal expertise is lacking, adding to administrative costs

Transparency:

- Often criticized for being too complicated for most people to understand

Political/Legal Feasibility:

- Given that the tax rate remains the same, less likely to be opposed when compared to other VC techniques involving new tax assessments
- Opposition sometimes is related to the likelihood that taxes will not keep pace with the intended funding for proposed public improvements
- Gentrification concerns for urban redevelopment projects.
- Opposition may come from similar developments that do not receive TIF benefits.

Macro-policy Goals:

- Beyond direct monetization of value appreciation, VC tools can serve larger policy goals (e.g., more jobs, more housing, smart growth based on TODs) by virtue of facilitating real estate development projects that trigger growth and serve as an economic impetus (see Section 3.1)
- Compared to other VC techniques such as SAD and DIF, TIF can better address economic development goals for blighted areas, which was its originally intended purpose

4.3 Special Assessment Districts (SAD)

Yield/Revenue Potential:

- Revenue risk is much lower because fixed assessments are due according to a fixed schedule regardless of the real estate market or overall economic condition
- District formation and planning processes are designed to ensure revenue needs are met
- Revenue can be raised as needed and approved by residents/tenants

Equity:

- Perception and expectation of equity (as well as receiving “special" benefits) are necessary conditions for organizing a district

Efficiency:

- District formation is a signal of expected net efficiency gains based on expectation that collective action and decision-making will result in an improvement of group welfare
- Time, effort, and resources are needed to organize, maintain, and administer districts

Administrative Ease:

- Requires technically skilled staff and tends to be procedure-laden with added administrative burden
- Relies on consultants if internal expertise is lacking, adding to administrative costs
- Poses inherent risk associated with the payment collection time frame—i.e., short timeframe creates hardship while long timeframe creates risk of involving staff unfamiliar with the district purpose and formation process

Transparency:

- District functions are transparent to district members but less transparent to the general public

Political/Legal Feasibility:

- Requires local ordinances covering district formation
- Given organizational efforts and decision-making costs, districts tend to include a limited number of members and functions tend to focus on small-scale commitments
- Districts can also be organized around larger projects if potential gains are substantial, apparent, and there is an equitable means to assign liability

Macro-policy Goals:

- Beyond direct monetization of value appreciation, VC tools can generally serve larger policy goals (e.g., more jobs, more housing, smart growth based on TODs) by virtue of facilitating real estate development projects that trigger growth and serve as an economic impetus (see Section 3.1)
- Because special taxes are often confined (per applicable SAD regulations established within a given State) to benefits that are “unique, measurable, and direct” to the assessment district itself, serving broad policy goals (other than those offered by the development projects themselves) is difficult

4.4 Development Impact Fees (DIF)

Yield/Revenue Potential:

- Depends on rate of development
- Revenue potential is sufficient because fees are generally enacted to cover the costs of public improvements
- Easy to predict revenues generated; predictability may vary with methodology used to calculate fees
- Yield tends to be routinely lower than amount needed to fully offset the development impacts on transportation infrastructure
- Can support pay-as-you-go, but upfront debt financing can be secured (backed by future yield) if major transportation improvements must be in place prior to development
- Typically one-time payments

Equity:

- Main challenge is to ensure equity between existing and new developments
- Tends to favor existing developments at the expense of future developments[15] (e.g., windfall gain for existing owners from property value increase with infrastructure improvements)
- Value capitalization may disproportionally impact lower income households by making housing less affordable, particularly for renters

Efficiency:

- Problems arise if fees are set below the marginal cost of providing infrastructure to new developments
- If impact fees are to be used for new developments but the improvements also benefit existing properties, efficiency is lost due to the breakdown of the basic premise that all those who benefit should pay (i.e., “free rider” issue)
- In general, efficiency losses tend to be less when compared to other VC tools

Administrative Ease:

- Administering impact fees can become very complicated with complex formula; requires skilled staff and time
- Trade-off between simplicity and accuracy in choice of methodology; often based on average trip generation by land use (e.g., residential, commercial)
- Distinguishing features in methodology: (a) trip basis of fee (i.e., how trips are accounted), (b) cost basis of fee (i.e., what is included in the cost), (c) disposition of expenditure (i.e., how funds are spent), and (d) credits and discounts (what project elements reduce cost of fees)

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[15] DIFs are generally associated with new developments where existing developments do not participate in the fee payment. Where DIF improvements benefit other, later developments that follow, reimbursement mechanisms are sometimes available (e.g., cost reimbursement district in California).

- If fees are directly related to trip generation estimates, administrative costs can be lower
- Can be facilitated through coordination with the development review process

Transparency:

- Transparency is improved when there is a straightforward relationship between the fees and trip generation
- Complex methodologies reduce transparency but can improve efficiency and equity
- In general, impact fees are among the most transparent VC tools

Political/Legal Feasibility:

- Courts have generally upheld the right to change impact fees as long as the essential nexus and rough proportionality tests[16] can be passed
- Legal and quantitative basis for fees can be enhanced by nexus and fee studies
- Residents generally support the basic premise of DIF, i.e., developments should pay their own way; developers also generally support DIF due to the predictability of their financial obligations and assurance of sufficient infrastructure capacity that support their development projects

Macro-policy Goals:

- Beyond direct monetization of value appreciation, VC tools can generally serve larger policy goals (e.g., more jobs, more housing, smart growth based on TODs) by virtue of facilitating real estate development projects that trigger growth and serve as an economic impetus (see Section 3.1)
- When impact fees are legislated into local ordinance, the DIF program can be incorporated into the local planning process and capital improvement program to help achieve long-term land use and economic growth plans and objectives
- Some impact fees, such as linkage fees, are specifically designed to address affordable housing policy goals

[16] Based on rulings from Nollan/Dolan Supreme Court cases, essential nexus and rough proportionality tests are required to impose development impact fees. They involve, respectively: (1) establishing a direct cause–effect relationship between the proposed project and the fees imposed on developers and (2) proving the need for the fee amount from developers to be roughly proportional to the impact created by the project. Nollan v. California Coastal Commission, 483 U.S. 825 (1987), https://supreme.justia.com/cases/federal/us/483/825/. Dolan v. City of Tigard, 512 U.S. 374 (1994), https://supreme.justia.com/cases/federal/us/512/374/.

4.5 Joint Developments, Development Agreements, and ROW Use Agreements

Yield/Revenue Potential:

- Difficult to predict; vary significantly from case to case
- Because each case is negotiated separately, there is a strong potential to assure sufficient revenues to cover needed improvements
- Financial obligations and risks that fall on developers (and other stakeholders) help to defray risks to government
- In the case of lease arrangements, revenue streams can be ongoing

Equity:

- Can be considered equitable because the intent of the process is to hold developers and other stakeholders responsible to enhance equity compared to a do-nothing situation
- Inequity may occur if earlier developers use spare capacity and subsequent developers are held accountable; can use "zone of benefit" concept to mitigate (i.e., recovery of offsite improvement costs that benefit others)

Efficiency:

- Generally efficient due to correspondence between cost obligation and benefits received
- Generally, encourages development designs that minimize transportation impacts and cost of mitigating impacts
- Efficiency issues can arise if the need for mitigation influences development location decisions
- Can require significant administrative resources for negotiations; more suited for large-scale developments where real estate values are relatively high

Administrative Ease:

- May be difficult and costly to administer
- Each case negotiated separately; less predictable
- Highly trained and experienced staff may be required

Transparency:

- Although each process can be clearly defined and established, cannot expect uniform, consistent outcome
- Potential for manipulation on either side of negotiation

Political/Legal Feasibility:

- Varies from jurisdiction to jurisdiction

Macro-policy Goals:

- Beyond direct monetization of value appreciation, VC tools can serve larger policy goals (e.g., more jobs, more housing, smart growth based on TODs) by virtue of facilitating real estate development projects that trigger growth and serve as an economic impetus (see Section 3.1)
- Especially for JDAs and DAs, because they are based on negotiated contracts, significant leeway exists to achieve local policy goals with broader community benefits as part of the contracts, such as local hiring, living wages, job training, community/recreational facilities (child care, senior and youth centers, etc.), open space and parks, etc.

CHAPTER 5: QUANTITATIVE ASSESSMENTS

5.1 Overview

The primary objective of quantitative assessments in making the value capture (VC) business/economic (B/E) case is to determine the magnitude of the potential VC revenues that could be allocated for infrastructure purposes. When the main VC driver is a major transportation corridor project where developments along the corridor are open ended and less well defined, the quantitative assessment can help determine the *maximum* VC potential that could support funding for both the core transportation corridor project and local transportation improvements ancillary to real estate development projects along the corridor. When the main VC driver is a relatively well-defined major real estate development project, the cost of ancillary improvements (including transportation) represents the anticipated VC potential that could serve as the basis for the quantitative assessment. This chapter focuses more on the former, i.e., open-ended case with maximum VC potential. The discussions should still apply for the latter case where the projects are better defined.

For the open-ended case, specific VC techniques considered in this chapter are tax increment financing (TIF), special assessment districts (SAD), and development impact fees (DIF), the three most common VC techniques that exist today. Transportation utility fees (TUF) are not included because they are not used for new developments but for existing properties to cover primarily infrastructure maintenance costs (often imposed as part of utility bills).[17] For other techniques that are dependent on specific developers and their projects—such as negotiated exactions, development agreements (DA), community benefits agreements (CBA), joint development agreements (JDA), and various use agreements—VC revenue potential varies significantly on a case-by-case basis and therefore they are also not included in the discussion. For those that are included, the basis for estimating VC revenues varies depending on the technique. For tax-based VC techniques such as TIF and SAD, the basis for VC revenues is the increase in assessed value of properties within the developments. For fee-based VC techniques such as DIF, the basis is the increase in trip generation by land use associated with the developments.

The following sections describe the basic components of the quantitative assessments, which consist of:

- Defining VC opportunity areas (OAs) and developing buildout scenarios for the OAs
- For different VC techniques, estimating the basis for VC revenues for the buildout scenarios, i.e., incremental assessed value (AV) for TIF and SAD and incremental trip generation for DIF
- Estimating VC revenue potential for different VC techniques for the buildout scenarios, including developing cash flows over the VC life cycle
- Estimating corridor- or system-level VC revenue potential by integrating the cash flows across all OAs

[17] This primer focuses primarily on capital costs of new developments. For techniques such as TUF that cover maintenance costs, potential VC revenues could be estimated based on the same trip generation by land use estimates provided for DIF in this chapter.

5.2 Defining Value Capture Opportunity Areas and Buildout Scenarios

Quantitative assessments initially involve identifying the VC OAs along the transportation corridor under consideration where substantive new developments could occur. As mentioned in Section 3.2, defining the OAs first entails identifying areas having high propensity to value capture—e.g., major highway intersections or transit stations with high growth potentials. Local jurisdictions at these major “nodes” along the corridor usually have approved general plans (GPs) and specific plans (SPs) that establish their future growth and land use plans, which help identify preferred OA locations. For each OA node, these GPs and SPs also help define the geographic extent of the VC catchment area as well as the VC propensity based on their overall growth plans and the maximum allowable densities coded into their land use/zoning plans.

Appendix B (Section B.1) provides a detailed description of how OAs could be defined specifically for transit-oriented developments (TODs). TOD examples are chosen here because there are existing TOD practices—including guidance (e.g., recommended TOD density range) established by the Federal Transit Administration (FTA), local/regional agencies, and industry organizations—that are directly applicable to VC quantitative assessments that make it easier to demonstrate the basic concepts.[18] The basic approach and concepts presented in Section B.1 are still relevant in the highway context. As highway VC applications expand, FHWA may consider supporting local jurisdictions in developing guidelines (e.g., the extent of VC catchment area and target densities based on locational characteristics of a given OA node) in the future for highways to facilitate the VC quantitative assessments.

Once the OAs are identified, the next challenge is to develop the VC buildout scenario within the VC catchment area associated with each OA node. This involves converting the current land use into higher density uses based on the maximum increase in density allowed by local land use/zoning plans as specified in the GPs and SPs. For this step, parcel-level GIS data for the VC catchment area is needed to help establish the existing conditions for the base case upon which incremental developments could be added to reach the buildout potential.19

Specifically, the existing GIS data needs include:

- For residential uses:
  - Number of dwelling units (DUs) and DUs per acre by low- and high-density housing (i.e., single- and multifamily, respectively) pertaining to the entire catchment area
  - Land and building areas (in square footage) for each residential parcel

[18] See, for example, *FTA, Planning for Transit-Supportive Development: A Practitioner s Guide*, June 2014, FTA Report No. 0052, https://www.transit.dot.gov/sites/fta.dot.gov/files/FTA_Report_No._0052.pdf.

[19] These parcel-level data are available from multiple data sources, including: (1) GIS data from State departments of transportation, metropolitan planning organizations, and/or local transportation agencies, (2) property assessors’ data from local jurisdiction(s), and (3) local GPs and SPs pertinent to the VC catchment area.

- For all other nonresidential uses (i.e., commercial, industrial, and other):
  - Floor area ratio (FARs) by each nonresidential use pertaining to the entire catchment area
  - Land and building areas (in square footage) for each nonresidential parcel

In addition, maximum allowable density ranges for each residential and nonresidential use within the VC catchment area are needed, which are available from the local GPs and SPs linked specifically to the OA node under consideration. Developing the buildout scenario entails increasing the existing densities for residential and nonresidential uses to the maximum allowable density range consistent with the relevant GPs and SPs for that node. Appendix B (Section B.2) uses a TOD example to provide a detailed description of how VC buildout scenarios could be developed.

Whether the quantitative assessment is for highways or transit, the basic exercise of developing a buildout scenario is about increasing higher density and higher value uses—i.e., (a) adding more higher density multifamily residential units and more commercial building areas for higher FAR and (b) where feasible, converting industrial uses and vacant lands to higher value residential and commercial uses. In general, most of the remaining uses—e.g., government/institutional, open space, etc.—are left unchanged. If local governments are performing the quantitative assessments, they will already be familiar with their GPs and SPs and have an understanding of the extent to which the densities could be increased and land uses could be converted.[20,21] On the other hand, if metropolitan planning organizations (MPOs), regional agencies, or State departments of transportation (DOTs) are performing the assessments, they will need to coordinate with local jurisdictions linked to each OA node under consideration to gain practical insight into the local plans.

For demonstration purposes, **Table 5** summarizes the real-world example presented in Appendix B (Section B.2) for Greenwood Station, a light rail transit (LRT) station on the new Gold Line extension currently under planning by Los Angeles County Metropolitan Transit Authority (LACMTA or LA Metro). Based on FTA recommendations, a 1/2-mile radius around the station is used as the VC catchment area where higher density TODs are most likely to occur (FTA 2014). Leaving single-family residential and other uses unchanged, the buildout scenario resulted in the following:

- Multifamily DUs increased by 1,730 units from 1,402 to 3,132 by increasing the density from 18 to 30 DUs per acre to 20 to 35 DUs per acre, which is still within the maximum allowable density range of 22 to 35 specified in the local zoning ordinance
- Leaving the land area unchanged, the building area for commercial uses increased by 212,200 square feet (SF) from 121,500 SF to 333,700 SF by increasing the FAR from 0.36 to 1.0, which is well within the range observed in nearby areas
- To accommodate the increase in multifamily and commercial uses, industrial uses were reduced by 858,700 SF and 2,760,200 SF in building and land area, respectively.

[20] As relevant, as part of the buildout exercise, local governments may need to consider local practices regarding up- and down-zoning and other zoning changes that are granted outside their GPs and SPs (e.g., variances, non-conforming uses, conditional use permits, spot zoning, etc.).

[21] In cases where GPs and SPs are outdated, local governments may need to revisit their growth plans for this exercise.

Table 5 Summary of buildout scenario—Greenwood Station example.

Land Use	Density Category	Unit	Existing	Buildout Scenario	Incremental Development
Residential	Single Family	No. of DUs	819	819	Unchanged
		DUs/Acre	6.5	6.5	Unchanged
		Allowable DUs/Acre	0 to 8		
	Multifamily	No. of DUs	1,402	3,132	1,730
		DUs/Acre	18 to 30	20 to 35	2 to 17
		Allowable DUs/Acre	22 to 35		
Commercial		Building Area (SF)	121,500	333,700	212,200
		Land Area (SF)	333,700	333,700	0
		FAR	0.36	1.00	0.64
Industrial		Building Area (SF)	2,811,700	1,953,000	-858,700
		Land Area (SF)	9,038,200	6,278,000	-2,760,200
Other		Building Area (SF)	67,100	67,100	Unchanged
		Land Area (SF)	7,882,500	7,782,500	Unchanged

5.3 Estimating Value Capture Revenue Basis

The basis for estimating VC revenues varies depending on the VC technique used. For TIF and SAD, the VC revenues are from taxes (whether ad valorem or special taxes requiring voter approval) derived from incremental AV of properties. For DIF, the revenues are from fees (generally no voter approval required) derived from the increase in number of trips generated by different land uses.

5.3.1 Increase in Assessed Value

In general, real property values increase from change in use and intensity of use resulting in (1) increase in density, (2) increase in unit value, and (3) reassessment where the increase in assessed value can exceed the statutory limit.[22] Estimating the increase in AV associated with the buildout scenario involves projecting the increase in unit price by use and applying that price to the incremental development by use.[23]

[22] In California, for example, assessed value for an existing property cannot increase more than 2 percent per annum statutorily unless there is a change in the property ownership (1978 Proposition 13, California Constitution Article 13, Section 1 - 7).

[23] Unit price projections require input from local real estate market expertise.

For demonstration purposes, **Table 6** presents the AV estimates for the same Greenwood Station example presented in **Table 5**. As shown, incremental AVs are estimated by applying unit price projections to the increase in number of multifamily DUs and commercial and industrial square footages presented in **Table 5**. The resulting total incremental AV associated with the buildout scenario is about $451 million, consisting of increases of $478 million and $58 million in residential and commercial uses, respectively, reduced by $85 million in industrial use that was converted. For Greenwood Station TOD, this $451 million increase in AV is the basis for applying, respectively, the ad valorem property tax and various special assessments linked to each OA node for TIF and SAD techniques.

Table 6. Assessed value estimates—Greenwood Station example.

Land Use	Unit	Existing	Buildout Scenario*	Incremental Development
Residential: Single-Family	Total AV ($)	$215,900,000	$215,900,000	Unchanged
Residential: Multifamily	$/DU	$136 to $150	$165 to $215	$250 to $300
	Total AV ($)	$207,500,000	$685,200,000	$477,700,000
Commercial	$/SF	$168	$204	$275
	Total AV ($)	$20,500,000	$78,800,000	$58,300,000
Industrial	Total AV ($)	$279,400,000	$194,100,000	-$85,300,000
Other	Total AV ($)	$14,400,000	$14,400,000	Unchanged
TOTAL		$737,700,000	$1,188,400,000	$450,700,000

* *Buildout scenario includes existing properties and unit price presented is average of existing and incremental developments.*

As a check and balance, the higher density buildout scenario must be reviewed with respect to market absorption, i.e., whether there is sufficient population and employment base to accommodate the proposed future growth (see Appendix B, Section B.3 for additional discussion on this topic). In considering market absorption, it should be recognized that new developments associated with the buildout scenario will generally occur over a long period (10 to 20 years) and the terms of VC financing (e.g., TIF- or SAD-backed bonds) are also generally quite long (typically 30 years).

5.3.2 Increase in Trip Generation

VC revenues from using DIF techniques are generally derived from the increase in the number of trips generated by incremental developments. New developments associated with VC buildout scenarios, especially those that are not primarily transit oriented, will likely generate new vehicle trips, where the rate of trip generation is generally dependent on land use. There are significant variations across different States on how and the extent to which DIF techniques are used, both in terms of the fee structure and the methodology for determining the fee levels. More often, the use of the DIF technique is project specific and likely to be negotiated on a case-by-case basis, an approach that is more vulnerable to legal challenge and more staff intensive to administer.

Local or regional governments are increasingly choosing to legislate impact fee structures and standardize fee schedules to make them more transparent. Among other benefits, this makes it easier for developers to determine all fee-related cost implications of their development projects upfront. These legislated impact fee structures and standard fee schedules are often based on comprehensive nexus studies on long-term capital improvement programs (CIP) linked to local GPs and SPs, where (1) the legal basis for essential nexus and rough proportionality tests are established programmatically, and (2) a clear methodology for determining the fee schedules is presented. The methodology often involves estimating trip generation by land use and developing the fee schedule based on the trip generation. Both the standard fee schedules and nexus studies are generally made available online and updated on a regular basis.[24]

Table 7 presents an example for the city of East Palo Alto, California, where a comprehensive nexus study was recently conducted to establish a formal development impact program consistent with the city's GP and SP (East Palo Alto 2019). **Table 7** summarizes the nexus study results, where the overall growth plan by land use in the GP and SP was translated into dwelling units of residential developments and square footage of nonresidential developments. These developments were the basis for estimating trip generation by residential and nonresidential uses.

[24] In California, for example, the Mitigation Fee Act (Government Code § 66000 et seq.) that regulates development fees requires that the nexus studies be updated every 5 years if the fees are legislated into local code. Local governments also typically update standard fee schedules on an annual basis to account for cost escalation.

Table 7. Trip generation and DIF fee estimates—East Palo Alto nexus study example.

Land Use	ITE Land Use Code	Trip Generation (Evening Peak Hour [PH])			Capital Improvement Transportation Projects Attributable to New Developments		Transportation Nexus Fee Estimate
					Total Cost ($)	$/Evening PH Trip	
Residential:		**DUs**	**Trips/DU (Adj.)***	**Total Trips**			**$/DU**
Town Houses	230	1,486	0.34	508			$2,358
Multifamily	220	1,033	0.26	266			$1,776
Nonresidential		**Building SF**	**Trips/1000 SF (Adj.***	**Total Trips**	$25,282,063	$6,898	**$/SF**
Office/ Research & Development	710	1,939,853	1.06	2,063			$7.34
Retail	820	333,406	1.93	643			$13.30
Industrial	119	267,987	0.69	185			$4.76
				Total	**3,665**			

* Trip generation rates shown represent Institute of Transportation Engineers (ITE) rates by land use adjusted to reflect special local conditions.

Typically, the trip generation methodology used in DIF is based on the Institute of Transportation Engineers' (ITE) Trip Generation Manual (ITE 2017/2020).[25] ITE trip generation rates by land uses—e.g., trips/DU for residential and trips/SF for non-residential—are generally the basis for initial estimates, which are often adjusted to account for special local conditions.[26] The estimate of the total number of trips is then linked directly to the specific projects identified in the capital improvement project (CIP) as part of the GP and SP.

As shown in **Table 7**, in the case of East Palo Alto, the specific transportation infrastructure projects identified in the CIP attributable to new residential and nonresidential developments were identified to be about $25.3 million, which is divided by the total evening peak hour (PH) trips of 3,665 to obtain the per-trip cost of $6,898. This per-trip cost is the basis for allocating the transportation capital costs across different uses and for calculating the final impact fees by use (which is obtained by multiplying the per-trip

[25] The ITE Manual provides trip generation by 176 different land uses, including 16 residential and 89 commercial uses.

[26] In the case of East Palo Alto, significant adjustments had to be made to account for local, specialized travel demand characteristics, intrazonal, nonmotorized, and public transit trips.

cost by number of evening PH trips by each use divided by dwelling units and square footage, respectively, for each residential and nonresidential use).[27]

Provided that the buildout scenario is consistent with the local GP and SP at a given OA node, where there are formal fee programs and published fee schedules at that node, they can be used in estimating potential VC revenues for the buildout scenarios by applying them to the buildout dwelling units and square footages. When applying these fees, the land use categorization in the buildout scenario must be consistent with those specified in the formal fee structure.

5.4 Estimating Value Capture Revenue Potential by VC Technique

For TIF and SAD, the incremental AV described in the previous section is the primary basis for determining the total new tax revenues—both ad valorem property tax and various special taxes—that could be generated under the buildout scenario. The more difficult challenge for these tax-based techniques is determining what portion of these new revenues local and regional governments are willing to allocate for transportation corridor projects that are outside their jurisdictions.

For DIF, where available, published fee schedules based on trip generation described in the previous section are the primary basis for determining total fee revenues that could be generated under the buildout scenario. The main challenge for these fee-based techniques is twofold: (1) most local governments may not have a formal fee structure or schedule that could be applied and (2) where there are formal fee schedules, they are based specifically on local CIPs that do not include transportation corridor projects that are outside their local jurisdictions.

5.4.1 Tax Increment Financing (TIF)

Jurisdictions generally consider the organic increase in ad valorem tax revenues resulting from the increase in AVs as their own revenues, wholly at their discretion and without any consideration for investments in transportation corridors that may have helped to generate them. To generate new revenues sources for transportation infrastructure using TIF, cities and counties must agree to contribute some part of their incremental revenues to the transportation authority that is responsible for building the transportation corridor.

Typically, each State allocates a portion of ad valorem property tax rate every year to cities and counties based on a pre-established formula (with the remaining balance going to the State). For Greenwood Station, for example, **Table 8** presents how a 1 percent ad valorem tax is allocated to Los Angeles County and the cities that are included within the 1/2-mile VC catchment area—in this case, the cities of Montebello, Pico Rivera, and Commerce. As shown, taxes are allocated based on tax rate areas (TRA) with different city/county tax allocation formula where there can be multiple TRAs within a given city with different tax implications. The table also shows total current AV associated with each TRA and the corresponding annual tax revenues due to the county and the cities.

[27] Nexus studies produce maximum legally allowable fee levels based on capital investment needs. Final published fee schedules often represent further adjustments from nexus study results based on additional economic feasibility studies to ensure that the fees are not so high that they discourage developments. In the case of East Palo Alto, for example, the fee schedule for retail developments was adjusted down from the maximum nexus study fee levels to make it more market responsive.

Table 8. *Ad valorem* tax allocation—Greenwood Station example.

Jurisdiction City	TRA	1% *Ad Valorem* Tax Allocation		Current AV	*Ad Valorem* Tax Revenue (Annual)	
		City	County		City	County
Montebello	6311/6330	0.344154112	0.098586280	$691,790,702	$2,380,826	$682,011
	6331	0.344154255	0.098586236	$19,068,826	$65,626	$18,799
	6338	0.344146086	0.098589214	$23,131,141	$79,605	$22,805
	7955	0.356172378	0.100571800	$5,863	$21	$6
	7965	0.354417465	0.101027208	$49,402	$175	$50
Pico Rivera	7947/7971	0.243537959	0.066671148	$616,234	$1,501	$411
Commerce	12462	0.373908792	0.069513598	$3,165,730	$11,837	$2,201
	Avg./Total	**0.3441982767**	**0.0984351551**	**$737,827,898**	**$2,539,591**	**$726,282**

It is important to note that these are annual tax revenues at a single OA node along the Gold Line extension transit corridor where the Greenwood station is located. If an agreement could be reached with the Los Angeles County and the affected cities (in this case, Montebello, Pico Rivera, and Commerce), a portion of these tax revenues could be allocated every year through TIF for LA Metro for all stations on the Gold Line extension. In the case of Greenwood, for example, a potential tax allocation scenario could be a 50 percent contribution from the county and the cities for any new tax revenues derived specifically from the TOD buildout. The revenues thus allocated could be leveraged to secure the upfront TIF debt financing with a term that could be as long as 30 years or more.[28]

For a given OA node, the final step in the quantitative assessment is to develop long-term cash flow estimates for both the full life cycle of the VC revenue potential and the potential TIF bonding capacity. This step requires additional information on:

- Timeframe of the VC revenue collection
- Timeframe for the TOD buildout, i.e., the market absorption period discussed earlier
- Statutory property value appreciation rate allowed for existing properties
- Average turnover rate on existing properties (and resulting average appreciation rate over the statutory rate to account for turnovers)
- Discount rate for net present value (NPV) analysis

[28] Most States have specific requirements on how long TIF districts can exist and the maximum term of TIF debt financing. Although not always the case, TIF districts are generally designed to dissolve once capital improvement costs are paid off. Also, a TIF financing term is generally about 30 years.

Appendix B (Section B.4) provides a detailed description of how annual TIF VC revenue is estimated and how TIF life-cycle cash flow is developed for the Greenwood Station example. Assuming 50 percent contribution by the county and all cities, the total nominal revenues over the VC life cycle are shown to be $167.4 million, which translates into $65.4 million in NPV.[29]

5.4.2 Special Assessment District (SAD)

Maximum VC revenue potential for SADs can also be estimated from the same incremental AV for the buildout scenario. This requires an understanding of basic local tax structure. As an example, the local tax structure for TRA 6311 in the city of Montebello included in the Greenwood case is presented in **Table 9** below.

Table 9. Local tax structure (city of Montebello)—Greenwood Station example.

Taxing Agency	TRA 6311 Tax Rate (2020-2021)
City of Montebello	0.197875
Community College	0.040162
LA County	0.000000
General *(Ad Valorem*—See **Table 6** for City/County Allocation)	1.000000
Metro Water District	0.003500
Unified Schools	0.097063
Total Effective Tax Rate	1.338600
Total Special Taxes Already Spoken For (Non-*Ad valorem*)	0.338600
Maximum Statutory Tax Rate	2.000000
Residual Tax Rate (Available for Additional Special Taxes)	0.661400

[29] These estimates are based on 45 years for VC revenue collection (consistent with the maximum term available for TIF debt financing associated with enhanced infrastructure financing districts [EIFDs] in California), 20 years for buildout, 1 percent additional appreciation over the 2 percent statutory limit to account for turnovers, and 3 percent discount rate. See Appendix B for a more detailed explanation of these assumptions. See footnote 38 for additional description of EIFDs.

As shown, the total current effective tax rate for this area is 1.3386 percent, which is made up of 1 percent ad valorem general tax rate and additional 0.3386 percent of special taxes that are allocated variously to the city of Montebello, the county, local school systems, and the water district. Assuming a maximum allowable effective tax rate of 2 percent,[30] this leaves a residual tax rate of 0.6614 percent available to impose new special taxes.

At a conceptual level, the maximum possible revenues from all special tax-based VC techniques can be estimated by applying this residual special tax rate to the incremental AV under the buildout scenario. This is shown in **Table 10** for the Greenwood example. As shown, under the buildout scenario, the $451 million increase in AV can potentially generate almost $3 million additional revenues each year in special taxes if the total tax rate is taken to its maximum statutory limit of 2 percent. Using a 30-year term with 5 percent interest rate more typical of SAD bond issuance, the corresponding NPV is estimated at about $46 million—in comparison to $65 million under the TIF technique. As practical, for this step, alternative taxing scenarios could also be tested. For example, instead of taking the special tax rate to the maximum statutory limit, a maximum tax rate of 1.75 percent could be considered more reasonable and acceptable by the industry, making the residual tax rate 0.41 percent instead of the 0.66 percent shown in **Tables 8 and 9**.

Table 10. Maximum potential for SADs—Greenwood Station example.

Description	Greenwood TOD
Current Assessed Value	$738,000,000
TOD Buildout Assessed Value	$1,189,000,000
New Incremental Assessed Value Under Buildout Scenario	$451,000,000
Current Total Effective Tax Rate	1.34%
Maximum Statutory Tax Rate	2.00%
Residual Tax Rate Unspoken For	0.66%
Remaining Taxing Capacity at Buildout	**$2,976,600**
NPV at 5% for 30 years	**$45,800,000**

[30] The 2 percent represents the maximum ad valorem tax rate generally accepted by industry professionals and often used in community facilities district (CFD) tax feasibility analyses in California. The ad valorem rate includes the 1 percent property tax rate and any additional voter-approved obligations.

As is the case for TIF, it is important to recognize that the SAD quantitative analysis presented in this section is conceptual, with a goal of determining the maximum potential tax revenues that could be achieved if the special tax-based VC techniques were used without consideration for potential implementation challenges.[31] Nevertheless, the maximum potential VC revenue estimates show the extent to which the use of VC techniques could supplement Federal, State, and other more traditional infrastructure funding sources.

5.4.3 Development Impact Fees (DIF)

For DIF, the published fee schedules by land use described in the previous section are the primary basis for determining total VC fee revenues that could be generated under the buildout scenario.[32] Most local governments, however, do not have formal impact fee programs and standard fee schedules by land use that could be easily applied in the context of VC quantitative assessment. Even for those local jurisdictions that already have established fee schedules, there is a significant level of specificity associated with their uses that makes it difficult to apply in the VC context. The need for such specificity stems largely from the need to establish a clear legal basis to meet the nexus and proportionality tests.

For the city of East Palo Alto, for example, different impact fees are established for different infrastructure types. In addition to transportation, there are separate impact fee schedules derived from using different methodologies for parks and trails, public facilities (government buildings, libraries, etc.), and storm drainage infrastructure categories. The total CIP associated with the city's current GP and SP amounts to about $255 million with individual projects identified under each category. For each category, the project needs for new developments must be separated out from those for existing developments to develop different impact fee schedules for that category. In addition, fee schedules are different for areas covered in SP from those for GP. For most cities and counties, there are also separate and distinct fee schedules for different districts within their jurisdictions.

In general, real estate development projects play an important role for local governments both in terms of the economic impetus provided by the projects and potential local revenues generated from development-related fees.[33] Therefore, it may be reasonable to assume that most local governments have a good handle on how to pay for local infrastructure (including local roads) needed to support major development projects—whether through DIF, other VC techniques, and/or other non-VC related funding sources—which is reflected in their general and specific planning processes.

The more difficult challenge is identifying new VC revenue sources that could help pay for transportation corridor projects that are outside local jurisdictions. For TIF and SAD, the VC revenues are value based and market dependent and, as long as cities and counties are willing to contribute, there is a strong "but-for" rationale[34] to attribute the incremental value to transportation corridor investments. For DIF, the

[31] The practical implementation challenges should be part of the qualitative assessment discussed in Chapter 4. For one, SADs sometimes require more stringent voter approvals (sometimes as high as 2/3) relative to TIF from property owners within the district.

[32] In the absence of full nexus studies and published fee schedules, rough market-responsive DIF revenues could potentially be estimated based on the prevailing DIF rates in adjacent local communities with similar real estate market characteristics.

[33] Among others, California and Florida are two States that make the most use of development-related fees. In California, for example, up to a third of some cities' budgets are composed of development-related fees.

[34] The recognition that real estate developments (and the resulting substantial increase in local tax revenues) would not be possible but for the core infrastructure project.

VC revenues are cost based (irrespective of market conditions) where the fees are linked directly to the local CIPs that generally do not include capital projects outside the local jurisdictions.[35]

If DIF techniques are to be used to pay for transportation corridor projects, it is necessary for each local government linked to each OA node to conduct additional nexus studies to identify a specific portion of the corridor project where clear legal basis for the nexus/proportionality requirements can be established for that node. Currently, it is generally accepted that local governments are not responsible for infrastructure projects outside their jurisdictions. As an example, even when local governments develop SPs that are specifically transit oriented and dependent on new transit stations nearby, no part of the transit-related costs are included in the SPs' CIPs because of the generally accepted assumption that the transit system will be paid for elsewhere.

In short, compared to TIF and SAD, it may be more challenging to estimate DIF-related revenue potential for open-ended cases without a significant shift in current practices and additional nexus study efforts on the part of local governments. For a major highway corridor project, provided that there is significant local buy-in and support for the project, one potential approach might be to define the VC OA as a 1/4-mile[36] band on either side of the corridor and develop a cost-per-trip unit measure that could be used by local jurisdictions to develop their own district-specific impact fees pertaining to that part of the corridor OA that falls within their jurisdictions. Potential DIF revenues from such an approach could work in concert with potential revenues from TIF and SAD as described earlier to defray some portion of the corridor funding gap. Ultimately, the goal is to use multiple VC techniques to spread out the capital costs as much as possible across multiple jurisdictions and stakeholders.

5.5 Quantitative Assessment at Corridor and System Level (Multiple Nodes)

The quantitative assessment described in all of the previous sections of this chapter is for a single node—e.g., a regional shopping mall project at a single highway intersection or TODs at a single transit station—which is a useful exercise particularly for the local jurisdiction where the node is located. Using the same approach used for a single node, similar assessments can be made at multiple nodes to determine the VC potential at corridor and/or system levels. These broader assessments are useful for Federal, State, and/or other regional agencies (including MPOs and transit authorities) that are engaged in providing major infrastructure projects that cut across multiple jurisdictions.[37]

To continue with the Greenwood example, the station is part of the Gold Line Eastside Extension that includes six new stations altogether along the new extended corridor. Using the same approach for the other stations as for Greenwood, the total VC revenues for the entire corridor are estimated to be more

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[35] Even for those impact fees whose benefits may extend beyond locally, such as a system development charge (SDC) or intersection development charge (IDC), the transportation facilities being considered must be part of the local CIPs.

[36] 1/4-mile is used here as a placeholder for discussion purposes; it is based on FTA's TOD zone recommendation for bus rapid transit (BRT) systems.

[37] In California, there is a unique "integrative" VC tool called Enhanced Infrastructure Financing District (EIFD) (Section 53398.51 of the California Government Code) that allows the formation of a district across multiple jurisdictions (which can be noncontiguous) that have a common interest in funding critical infrastructure projects with regional significance. EIFDs can issue 45-year TIF bonds secured by any and all existing revenue sources agreed to by the member jurisdictions. At the corridor or system level, a VC technique such as EIFD is a useful tool to integrate the VC potential at multiple nodes.

than $1 billion in nominal value and more than $410 million in NPV (see Appendix B, Section B.5, for additional details on these estimates).

Likewise, quantitative assessment can be performed at the system level involving multiple corridors. Whether for transit or highways, the only difference is that the implementation of each corridor may be phased with a different timeline and the cash flows need to be staggered to reflect such phasing. **Figure 3** provides an example for all future corridors currently under construction or planning by LA Metro, inclusive of the Gold Line Eastside Extension (and Greenwood Station) discussed earlier (see Appendix B for VC revenue estimates for all new future corridors presented in **Figure 3**).

The above example represents 45-year cash flows consistent with the maximum TIF bond term allowed in California, which are staggered based on the opening date of each corridor. **Figure 3** also assumes that the TOD buildout will occur over 20-year period (indicated by the black squares) starting with the opening date for each corridor. It also shows that the TIF district formation and, therefore, the collection of VC revenues could start a few years prior to the opening date to coincide with the construction start date for each corridor (see Appendix B for additional discussion).

Figure 3. Chart. Cash flow phasing under systemwide assessments—LA Metro example.

Line/Corridor	No. Stations	Opening Date (Status)	2020-30					2030-40					2040-50					2050-60					2060-70					2070-80				
			2	4	6	8	10	2	4	6	8	10	2	4	6	8	10	2	4	6	8	10	2	4	6	8	10	2	4	6	8	10
Crenshaw/LAX	9	2022	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉							
Regional Connector	4	2022	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉							
Purple Line Extension	5 (Sect 1&2)	2024	◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉							
	2 (Sect 3)	2028			◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉					
Gold Line Extension	4 (Foothill)	2026		◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉						
	6 (Eastside)	2036							◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	
E. San Fernando Valley	14	2028			◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉					
Green Line to Torrance)	2	2030				◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉				
W. Santa Ana Branch	9	2042										◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉
Sepulveda Transit	4 (to Westside)	2034						◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉		
	5 (to LAX)	2058																		◉	◉	■	■	■	■	■	■	■	■	■	■	◉

Source: LA Metro (2020). (Note: "◉" *denotes the 45-year span in the VC assessment life cycle and "■" denotes the 20-year buildout period with the 45-year span.)*

5.6 Additional Considerations

Delimiting Factors. Basic characteristics of specific VC techniques can provide certain delimiting factors in quantifying the VC revenue potential. In general, VC tools can be either value based (e.g., TIF, based on existing *ad valorem* tax base) or primarily cost based (e.g., SAD based on special taxes). When using TIF for TODs, for example, as described in this chapter, the *maximum VC revenue potential* can be derived based on the maximum assessed value that could be achieved by applying the highest density possible. When using SAD on a major real estate project, special taxes assessed are based primarily on the cost of ancillary public improvements necessitated by the project and the *minimum VC revenue required* in this case is based on these costs. These delimiters can serve as an indication of the outer range of VC revenue potential that could be obtained.

Under the SAD technique, when a direct nexus between the real estate project and a core infrastructure project (such as a major transportation corridor) can be proven, additional costs of core infrastructure could be added to the special tax assessments. Even without any allocations to core infrastructure, these special tax-based VC tools enable real estate developments to occur and help increase property values and tax revenues (which could alternatively be captured through TIF).

Simplifying the Quantitative Assessment. Depending on the needs of a project, the quantitative assessments described in this chapter can be simplified. In particular, instead of going through the exercise of developing the VC buildout scenario (with its outcome as presented in **Table 5**)—which is perhaps the most involved and cumbersome step that may require local real estate market knowledge—a set of reasonable what-if buildout scenarios could be developed simply based on percent increase from the current AV. For example, two potential buildout scenarios might be represented, respectively, by 50 percent and 100 percent increase from the current AV, which could be based on the range of historical growth observed around new stations with similar locational characteristics. This simplified approach still requires that the total current AV for the VC catchment area be estimated based on actual data. Once the buildout scenarios are established with respect to the current AV, the rest of the steps will be simpler, involving applying appropriate existing tax rates and building the corresponding cash flows.

Need for Fiscal Impact Assessment/Economic Impact Assessment (FIA/EIA). If possible, along with the VC quantitative assessments, it is beneficial for local jurisdictions to conduct relevant fiscal and economic impact assessments. Given that local revenues have competing needs, local agencies can gain a better understanding through these assessments of the overall fiscal impact of contributing part of their future tax revenues for VC purposes (while keeping in mind that real estate developments and the resulting increase in local revenues may not have been possible "but for" the core infrastructure projects). In addition to revenue impacts, it is helpful for such fiscal assessments to also consider any costs involved on the part of the local governments in administering specific VC techniques. Assessing overall economic impacts of implementing one or more VC techniques uncovers potential tradeoffs if the VC revenues are allocated for other public benefit purposes.

CHAPTER 6: MAKING THE BUSINESS/ECONOMIC CASE IN DIFFERENT PROJECT CONTEXTS

6.1 Real Estate Development Project Context

Historically, value capture (VC) techniques have been used predominantly in the context of major real estate development projects. They have been used primarily to fund various local transportation and other support infrastructure improvements necessitated by the real estate projects. Public improvements funded through VC techniques typically have included:

- Streets, roads, and other right-of-way (ROW) improvements within the real estate project boundary
- Offsite improvements to roads and intersections impacted by the real estate project.
- Additional capacity in utilities, including gas, electricity, cable television, telecommunications, water, sewer, storm drainage, etc.
- Additional capacity in public services, including police, fire, emergency, etc.
- Provisions for open space, including parks and pedestrian and bicycle facilities
- Other infrastructure improvements as required by the environmental mitigation measures to reduce the impacts of the real estate project

When the main VC driver is a major real estate development project, making the business/economic (B/E) case for VC is mostly about determining the specific publicly funded improvements needed to support the specific land use program called for in the project. The cost of these improvements establish the minimum level of funding that must be generated by using one or more VC techniques.

For real estate projects, developer exactions or contributions (e.g., developer impact fees) can be looked at as the first source of potential VC revenues. The level of developer fees, however, is in large part limited by the overall project economics and by local jurisdictions' ability to pass the essential nexus and rough proportionality tests. When these fees are not enough to cover all the improvement costs, the next step is to explore one or more government-sponsored VC techniques, such as tax increment financing (TIF) and/or special assessment districts (SAD).[38] When multiple VC techniques are used for a given project, a useful integrative tool is a development agreement (DA), in which the developer and local agency can together spell out specific VC tools to use to pay for specific public improvements.

For those real estate projects with significant positive economic impacts on local communities that require major publicly funded improvements, local governments can also choose to provide additional funding from their general fund to supplement the VCgenerated revenues. For some of these projects, local governments can also decide to enter into a joint development agreement (JDA) by committing public assets or ROWs in exchange for various revenue sharing arrangements with the developers.
The additional revenues thus generated can be leveraged in part to pay for the needed public improvements on the project.

[38] In particular, the use of SAD, as is the case for impact fees, can sometimes be limited to those specific improvements that are "unique, measurable, and direct" to the assessment district itself (e.g., sidewalks, sewer lines) and exclude general community-wide benefits beyond the district (e.g., parks, library, and some offsite improvements).

In short, for real estate development projects, all of the above discussions—i.e., what VC techniques are used and how the projects are structured—have some bearing in making the B/E case for VC. Ultimately, however, it is the cost of the improvements that drive the VC needs.

6.2 Core Infrastructure Project Context

When the main VC driver is a core infrastructure project (such as a new highway or transit corridor), making the B/E case for VC is essentially about establishing the direct nexus between the core infrastructure project and any major real estate developments that are triggered by the project (such as a regional shopping mall at a major highway intersection or transit-oriented developments [TODs] at a centrally located transit station). Here, the strongest rationale for the direct nexus is on “but-for” grounds—the recognition that real estate developments (and the resulting substantial increase in local tax revenues) would not occur without the core infrastructure project.

Although there are some precedents,[39] the use of VC techniques to pay for core infrastructure projects have been limited to date. Yet, VC techniques are useful for generating alternative local funding sources for core infrastructure projects to supplement traditional Federal and State funding sources. For critical core infrastructure projects with lasting positive impacts in local communities around the United States, the overall approach to VC could be more expansive and innovative than how the techniques have been used to date.

For TIF, the key is to gain a formal recognition on the part of the local and regional governments of the “but-for” rationale to increase their willingness to contribute and to determine the level of tax revenue allocation that is reasonable and acceptable for all. For SAD, though limited, the successful, existing precedents for funding major transit corridors (e.g., the Metrorail Silver Line connecting Northern Virginia areas with Dulles International Airport)—over and above public improvements to support local real estate projects—indicate that its use could have much wider applications for core infrastructure projects throughout the United States. There has been increasing voter support for public transit and the use of sales tax districts to generate additional revenues for transit projects. The private sector-driven TODs, however, have not kept pace with public investments in transit stations (Kim, 2018). The strategic use of VC techniques could potentially serve as the catalyst for robust TODs along major transit corridors in major U.S. cities.

For VC to be successful for core infrastructure projects, it is essential for there to be buy-in from local and regional governments. Various incentive measures could motivate local and regional governments to contribute their tax dollars for VC purposes. As a case in point, LA Metro has recently established a capital project acceleration policy[40] that incentivizes local governments’ participation. The policy outlines conditions under which local governments can help accelerate those Metro projects that directly benefit their own communities. These conditions have included: (1) generating new local revenue sources to supplement Metro funding, including the use of VC techniques; (2) having streamlined local planning and environmental review processes; (3) ensuring strong local partnerships; and (4) providing opportunities for innovations that achieve project efficiency gains, including engaging private partners.

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[39] For example, two SADs have been largely responsible for funding the new Metrorail Silver Line designed to connect the fast-growing Northern Virginia area with Dulles International Airport.

[40] LA Metro Proposed Policy, Project Acceleration/Deceleration Factors and Evaluation Process, October 2017.

The qualitative and quantitative assessments provided in Chapters 4 and 5 to make the B/E case for VC are directly applicable in the context of core infrastructure projects. The basic approach presented can be used not only by local/regional governments but also by State departments of transportation (DOTs), metropolitan planning organizations (MPOs), and regional transit authorities to support and encourage the use of VC techniques and help build critical infrastructure projects as planned.

6.3 Public-Private Partnership (P3) Project Delivery Context

Value capture is essentially about generating revenues to pay for infrastructure, whether they are for infrastructure projects or other publicly funded improvements linked to real estate development projects. When used for infrastructure projects, VC techniques provide a potential funding (revenue) source for the project and do not address directly the method used to deliver the project nor the securing of upfront financing for that particular project. Though not a project financing/delivery mechanism per se, VC revenues can play an important role when a public-private partnership (P3) model is used to deliver and finance core infrastructure projects.

The P3 delivery model is a whole-life, performance-based capital project delivery method that comes with a private-sector project financing package over the project life cycle. The P3 delivery model is performed through a long-term concession agreement, sometimes referred to as a comprehensive development agreement (CDA),[41] between a private concessionaire and a government sponsor. In general, securing a P3 project financing package upfront by the private sector is based on reasonable assumptions about an anticipated future funding (i.e., revenue) stream.

Typically, P3 is delivered using either a revenue-risk (RR) (also referred to as demand-risk) P3 model or an availability payment (AP) P3 model. As shown in **Table 11**, under RR P3, most of the anticipated funding (revenue) generally comes from third-party user charges with the private sector taking on the revenue (or demand) risk. Under AP P3, the more prevalent of the two models, the anticipated funding (revenue) comes from the public sponsor where the private sector is paid pre-established annual payments (albeit contingent on performance) for the life of the contract, in part for securing the upfront financing. In short, under AP P3, the long-term P3 financial liability lies on the public sponsor's shoulders.

When a P3 project is based on an AP P3 model with a significant real estate development component within its scope, it offers opportunities to use VC techniques in the real estate component to generate additional funding sources to support the infrastructure component. In this case, the public sponsor administers the VC techniques, and the VC revenues generated help defray the public sponsor's P3 annual payment obligations.

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[41] P3 concession agreements are often referred to as comprehensive development agreements (CDAs), which should not be confused with a development agreement (DA) in the VC context.

Table 2. Revenue sources and risks for two prevalent P3 models.

Parameter	P3 Model	
	Revenue Risk (RR) P3	Availability Payment (AP) P3
Primary Revenue Source	User Charges	Annual Payments from Public Sponsor
Type of Risk	User Demand (i.e., Revenues from Users)	Public Sponsor Fiscal Status
Risk Bearer	P3 Private Concessionaire	Public Sponsor

When real estate is part of the P3 project structure, it is important to recognize that real estate and infrastructure assets are inherently different from a financing standpoint. From an investor's perspective, the risk profiles are different, appealing to different market segments.[42] Some infrastructure investors can accept real estate risk within their investment portfolio, providing opportunity to gain some economies-of-scale benefits. To maximize the development opportunity for a P3 project, public sponsors have an incentive to structure the deal to get the best of both real estate and infrastructure markets in the most efficient way.

AP P3 projects can still benefit from VC when real estate is not part of the P3 deal structure. As separate and distinct from the P3 project, P3 public sponsors can set up TIF districts and/or SADs adjacent to P3 infrastructure projects to generate new VC revenues to fulfill their P3 obligations. Such a VC approach enables the public sponsors to help establish clear and steady revenue streams for P3 purposes, which in turn helps to minimize the cost of private capital (both debt and equity) involved in P3 project financing. When applied appropriately, P3 project delivery combined with the use of VC techniques could potentially provide a win-win situation—private sector life-cycle efficiency gains combined with public sector low-cost financing to successfully implement core infrastructure projects.

[42] The infrastructure market is about longer term, government-backed, and contractually secured obligations for essential public projects where valuations are typically stable (especially for AP P3 projects; RR P3 projects are subject to economic recession risks). The real estate market, on the other hand, is about shorter term investments secured by land-related values and taxes/fees/charges considered nonessential, catering typically to local private office, residential, or retail markets. Valuations vary depending on location and the demand/supply of inventory is subject to greater volatility during economic recessions. Projects that combine these elements without good understanding of both markets can create conflicting risk profiles, lost opportunity/value, and reduced market interest.

APPENDIX A: VALUE CAPTURE (VC) TECHNIQUES USED IN DIFFERENT PROJECT CONTEXTS—PROJECT EXAMPLES

Mode	Project Description				Project Funding Size ($ Million)		Land Value Capture Category					
	Project Name	State	Location	YR	Total	VC Share (%)	TIF	SAD	DIF	Other Developer Based	JDA/ROW Use/Zoning	Others
Local Roads	Lake Shannon Road Improvements	MI	Tyrone Suburban	2018	$1	$1 (100%)		✔				
	East Fifth St. Rehabilitation	OR	Newberg Suburban	2018	$2	$2 (100%)		✔ (TUF)				
	Century Garden Community Development	FL	Miami-Dade County Exurban	2019	$3	$2 (60%)		✔				
	Poplar Road Safety Improvements	VA	Stafford County Suburan	2016	$4	$2.3 (58%)			✔			
	The Cap at Union Station	OH	Columbus Urban	2004	$8	$8 (100%)				✔	✔ (ROW Use)	
	Hackberry Hidden Cove	TX	Hackbery Suburban	2017	$11	$100 (100%)		✔		✔		
	US Hwy 441/27 Utility Relocation	FL	Leesburg Suburban	2010	$12	$12 (100%)	✔					
	Tallgrass Creek Project	KS	Overland Park Suburban	2017	$12	$15 (100%)		✔ (TDD)				
	Las Vegas Skye Canyon Phase 3	NV	Las Vegas Urban	2020	$68	$68 (100%)		✔		✔		
	State Street Redevelopment	IN	W. Lafayette Urban	2019	$123	$123 (100%)	✔					

Mode	Project Description				Project Funding Size ($ Million)		Land Value Capture Category					
	Project Name	State	Location	YR	Total	VC Share (%)	TIF	SAD	DIF	Other Developer Based	JDA/ROW Use/Zoning	Others
	BelRed Street Network	WA	Bellevue Suburban	2022	$323	$159 (49%)	✔	✔ (LID)	✔		✔ (Zoning Incentive)	✔ (Private Contribution)
Local Roads	Osceola County Roadway & Bridge Bundling	FL	Osceola County Suburban	n/a	$350	$350 (100%)			✔ (Mobility Fee)			
	Capitol Crossing/3rd Street Tunnel	DC	Washington Urban	2022	$1,300	$1,300 (100%)					✔ (ROW Use)	
High-ways, Bridges and Inter-changes	Conroy Road Bridge	FL	Orlando Exurban	2000	$28	$23 (82%)	✔	✔ (LID)	✔			
	Route 33 Interchange	PA	Easton Suburban	2015	$44	$37 (84%)	✔			✔ (Land & In-Kind)		
	I-5 Fern Valley Interchange	OR	Phoenix Suburban	2016	$72	$7 (10%)			✔ (IDC/SDC)			
	I-5 Woodburn Interchange	OR	Woodburn Suburban	2015	$75	$8 (11%)			✔ (Traffic Impact Fee/ IDC)			
	Atlantic Station 17th Street Bridge	GA	Atlanta Urban	2005	$76	$76 (100%)	✔ (TAD)	✔				✔ (Private Contribution)
	Route 36 Four Laning	MO	Hannibal to Macon Suburban	2010	$76	$34 (45%)		✔ (TDD, Sales Tax)				
	Americas Interchange (Phase 1)	TX	El Paso Suburban	2016	$141	$30 (21%)	✔ (TRZ)					

Mode	Project Description				Project Funding Size ($ Million)		Land Value Capture Category					
	Project Name	State	Location	YR	Total	VC Share (%)	TIF	SAD	DIF	Other Developer Based	JDA/ROW Use/Zoning	Others
	Eleventh Street Bridge Project (Phase 1)	DC	Washington Urban	2015	$309	$4 (1%)						✔ (Private Contribution)
	King Coal Highway (Red Jacket Section)	WV	Southern WV	2011	$340	$150 (44%)				✔ (In-Kind)		✔ (Private Contribution)
High-ways, Bridges and Inter-changes	I-15 Express Lanes	CA	Riverside County Suburban	2020	$461	$208 (45%)		✔ (LOTT)				
	Route 28 Corridor Improvements.	VA	Fairfax & Loudoun Counties	2017	$488	$433 (89%)		✔ (TID)				
	US 36 Express Lanes (Phase 1&2)	CO	Denver Metro Area	2015	$520	$142 (27%)		✔ (Sales Tax Dist; RTD)				
	I-285/SR400 Interchange Reconstruction	GA	Fulton & DeKalb Counties, Urban	mid-2020	$803	$10 (1%)		✔ (CID)				
	US 181 Harbor Bridge	TX	Corpus Christi Suburban	2021	$1,065	$39 (4%)	✔ (TRZ)					
	SR-91 Corridor Improvements	CA	Riverside Suburban	2017	$1,312	$709 (54%)		✔ (Sales Tax Dist)				
	Loop 202 S. Mountain Freeway	AZ	Phoenix Urban	2020	$1,837	$1,138 (62%)		✔ (LOTT)				
	Chicago Region Env, & Transp Efficiency (CREATE) Program	IL	Chicago Urban	On-going	$1,900	$375 (20%)						✔ (Private Contribution)

Mode	Project Description				Project Funding Size ($ Million)		Land Value Capture Category					
	Project Name	State	Location	YR	Total	VC Share (%)	TIF	SAD	DIF	Other Developer Based	JDA/ROW Use/Zoning	Others
	I-405 Improvements.	CA	Orange County Exurban	2023	$1,908	$1,145 (60%)		✓ (Sales Tax District)				
	Assist Patrol Program (State Farm Safety Patrol)	OH	Statewide	On-going	n/a	$9 (n/a)					✓ (Naming Rights)	
	Mass DOT Highway ROW Solar	MA	Statewide	On-going	n/a	$17 (20 yrs)					✓ (Solar Energy)	
High-ways, Bridges and Inter-changes	I-96/M-44 Solar Canopy	MI	Grand Rapids Suburban	On-going	n/a	Annual					✓ (Solar Energy)	
	I-5 Highway Baldock Solar Station	OR	Wilsonville Suburban	On-going	n/a	n/a					✓ (Solar Energy)	
Toll Roads/Highways	Orchard Pond Parkway	FL	Tallahassee Suburban	2016	$17	n/a				✓ (Land Dedication)		
	Poinciana	FL	Osceola & Polk Counties Suburban	2016	$141	$38 (27%)				✓		
	Puerto Rico PR-22/PR-5 Lease	PR	Northern PR	2011 (40-yr lease)	$1,436	$1,080 (lease proc.)						✓ (Asset Recycling)
	San Joaquin Hills Toll Road	CA	Orange County Suburban	1996	$1,456	$31 (2%)			✓			

Mode	Project Description				Project Funding Size ($ Million)		Land Value Capture Category					
	Project Name	State	Location	YR	Total	VC Share (%)	TIF	SAD	DIF	Other Developer Based	JDA/ROW Use/Zoning	Others
	Chicago Skyway	IL	Chicago Urban	2005 (99-yr lease)	$1,830	$1,003 (lease proc.)						✓ (Asset Recycl.)
	Indiana Toll Road	IN	Northern Indiana	2006 (75-yr. lease)	$3,800	$3,800 (lease proc.)						✓ (Asset Recycling)
	E-470 Toll Road Solar	CO	Statewide	On-going	n.a.	$1 (20 yrs)					✓ (Solar Energy)	
	South Lake Union Streetcar	WA	Seattle Urban	2007	$54	$25 (47%)		✓ (LID)				
Transit/Multi-modal	NoMa-Gallaudet U Metrorail Station	DC	Washing-ton Urban	2004	$104	$35 (34%)		✓ (BID)		✓ (Land Dedication)		
	Airport MAX Red Line	OR	Portland Urban	2001	$126	$52 (41%)	✓ (URA)				✓ (JDA)	✓ (Private Contribution)
	Potomac Yard Metrorail Station	VA	Alexandria Urban	On-going	$250	$250 (100%)	✓	✓		✓		
	Portland Streetcar	OR	Portland Urban	2012	$251	$56 (22%)	✓	✓ (LID)				
	Reno Transport. Rail Access Corridor	NV	Reno Suburban	2006	$280	$17 (6%)		✓ (Sales Tax Dist)				✓ (Private Contribution)
Transit/Multi-modal	Heartland Corridor	KY OHVA WV	Various	2015	$354	$144 (41%)						✓ (Private Contribution)
	CTA Blue Line	IL	Chicago Urban	2019	$409	$9 (2%)	✓	✓ (Sales				

Mode	Project Description				Project Funding Size ($ Million)		Land Value Capture Category					
	Project Name	State	Location	YR	Total	VC Share (%)	TIF	SAD	DIF	Other Developer Based	JDA/ROW Use/Zoning	Others
								Tax District)				
	Atlanta Belt Line	GA	Atlanta Urban	On-going	$500	$221 (36%)	✔ (TAD)					✔ (Private Contribution)
	Las Vegas Monorail	NV	Las Vegas Urban	2004	$650	n/a						✔ (Transp. Corp.)
	Dallas Area Rapid Transit (DART)	TX	Dallas Urban	2014	$1,297	$1,065 (82%)		✔ (Sales Tax District)				
	Chicago Transit Authority	IL	Chicago Urban	2018 – 2022	$1,421	$678 (48%)	✔	✔ (Sales Tax District)				
	Moynihan Train Hall	NY	NYC Urban	2020	$1,850	$230 (12%)				✔	✔ (JDA)	
	San Diego Assoc. of Governments (SANDAG)	CA	San Diego Urban	2021	$2,017	$355 (18%)		✔ (Sales Tax Dist)				
	Transbay Transit Center (Phase 1) (Salesforce Tower)	CA	San Francisco Urban	2018	$2,260	$290 (13%)		✔ (CFD, Sales Tax District)			✔ (ROW Use, Naming Right)	
Transit/Multimodal	Washington Metro. Area Transit Authority (WMATA)	DCM DVA	DC Metro Area	2004	$2,324	$560 (24%)		✔ (Sales Tax District)				

Mode	Project Description				Project Funding Size ($ Million)		Land Value Capture Category					
	Project Name	State	Location	YR	Total	VC Share (%)	TIF	SAD	DIF	Other Developer Based	JDA/ROW Use/Zoning	Others
	Denver Regional Transport. District (RTD)	CO	Denver Urban	2014 – 2017	$2,531	$193 (8%)		✔ (Sales Tax District)				
	Dulles Corridor Metrorail	VA	Northern VA	2019	$5,683	$590 (10%)		✔ (LID)				
	Sound Transit	WA	Seattle Urban	2017 – 2021	$6,344	$2,131 (34%)		✔ (Sales Tax District)				
	LA Metro (LACMTA)	CA	Los Angeles Urban	2019 – 2025	$7,419	$2,361 (32%)		✔ (Sales Tax District)				
	CTA Corporate Partnership	IL	Chicago Urban	On-going	n/a	n/a						✔ (Corporate Sponsor)
	Atlantic Ave Barclay Center Station	NY	Brooklyn Urban	On-going	n/a	$4 (n/a)					✔ (Naming Right)	
	South Lake Union Streetcar	WA	Seattle Urban	2007	$54	$25 (47%)		✔ (LID)				
Telecom	Kentucky Wired	KY	Statewide	On-going (30 yrs)	$412	n/a					✔ (ROW Use)	

N.A.= NOT AVAILABLE

APPENDIX B: QUANTITATIVE ASSESSMENTS—TOD PROJECT EXAMPLES

The following provides a detailed description of quantitative assessments pertaining to transit and transit-oriented development (TOD) examples. As mentioned in Chapter 5, there are existing TOD practices—including guidance (e.g., recommended TOD density range) established by the Federal Transit Administration (FTA), local/regional agencies, and industry organizations[43]—that are directly applicable to value capture (VC) quantitative assessments that make it easier to demonstrate the basic concepts. The examples presented are from the recent value assessment study conducted by LA Metro on its new transit corridors that are either in planning or under construction (LA Metro 2020). Focusing on tax increment financing (TIF) and special assessment district (SAD) techniques, the discussions below mirror the basic steps outlined for quantitative assessment in Chapter 5 using LA Metro station and corridor examples. The basic approach and concepts presented below are still relevant and useful in the highway context, especially when contemplating the type of guidelines that may be useful in the future for highways to facilitate the VC quantitative assessments.

B.1 Defining Value Capture Opportunity Areas

As mentioned in Chapter 5, the first step in the quantitative assessment of making the VC business/economic (B/E) case is to identify the VC opportunity area (OA) and the maximum development density that could be accommodated in that OA. As described in Section 3.2, defining VC OAs entails three primary factors: (1) defining the VC catchment area, (2) determining the VC propensity factor, and (3) developing the VC buildout scenario.

First, for the VC catchment area, for dedicated light rail transit (LRT) or heavy rail transit (HRT) corridors, the Federal Transit Administration (FTA) recommends a 1/2-mile radius[44] around each station as the geographic boundary where the higher density TODs are be most likely to occur (referred to as the TOD buffer zone) (FTA 2014). For bus rapid transit (BRT), this buffer zone is reduced to a 1/4-mile radius. These TOD buffer zones could serve as the catchment areas for transit station VC nodes.

Second, regarding the VC propensity factor, **Figure B.1** shows the relative TOD propensity scale recommended by the Center for Transit-Oriented Development (CTOD) relative to the locational characteristics (CTOD 2010, 2011, 2013). As shown, the higher the percentage of workers in the population (i.e., higher commuter concentration) and the higher the average vehicle-miles traveled per household (VMT/HH) (i.e., higher commuting distance), the more amenable the location is for TODs and, as a result, the higher the VC propensity (as represented by the darker shades and higher rankings).

Finally, regarding the VC buildout scenario, several Federal, State, and local guidelines currently exist regarding the recommended TOD density range along the urban-suburban locational spectrum (see, for example, FTA 2014, PPIC 2011, PSRC 2014, and MPC-SP 2018). For dedicated LRT or HRT, **Table B.1** provides examples of TOD density guidelines for commercial (in floor area ratio or FAR) and residential (in dwelling units per acre or DU/acre) uses. These densities could serve as the maximum target densities in developing the maximum buildout scenario for the VC catchment area under consideration.

[43] See, for example, CTOD (2010, 2011, 2013), FTA (2014), MSP-SP (2018), PSRC (2014).

[44] Generally indicative of the maximum distance a commuter is willing to walk to a nearby transit station.

These target densities should be compared against the maximum allowable densities specified by the local land use and zoning regulations. Where the TOD density guidelines are above the locally allowable density, the local zoning governs the buildout density used.

Figure B.1. Illustration. Relative TOD propensity mapping/scale.

Source: Based on CTOD (2010, 2011, 2013)

Table B.1. Recommended density range in TOD buffer zone.

Setting	FTA Guidelines		Select Local Guidelines on Residential Density (DU/Acre)		
	FAR (Commercial)	DU/Acre (Residential)	Bay Area MTC	City of San Diego	Sacramento Regional Transit
Urban Center (Central Business District)	n/a	n/a	16–60	n/a	36 (minimum)
Urban	2.1 (mean); 1.37 (median)	36.3 (mean); 36 (median)	10–30	17–30 (mean); 12 (minimum)	15 (minimum)
Suburban	0.65 (mean); 0.32 (median)	17.4 (mean); 10.9 (median)	5–20	13–20 (mean); 8 (minimum)	10 (minimum)

Sources: FTA (2014), PSRC (2014)

B.2. Developing Value Capture Buildout Scenarios

Once the catchment area and target buildout density are defined, the next step is to develop a VC buildout scenario for the catchment area by converting the current uses into higher density uses. This step first involves obtaining parcel-level data on existing properties within the VC catchment area, including:

- Allowable density range by local zoning designation (e.g., residential, commercial, industrial, public, open space/other)
- Zoning designation for each parcel
- Land and building areas for each residential and nonresidential parcel
- Assessed value (AV) of each residential and nonresidential parcel for both land and building
- Number of dwelling units for each residential parcel
- Floor area ratio for each nonresidential parcel

These data help establish existing conditions for the base case upon which incremental developments can be added to reach the buildout potential.

For TODs, the overall development potential for a given station considers the current characteristics of the community and the types of growth that are consistent with TOD land uses—i.e., more commercial and higher density residential and less industrial uses. In other words, to develop the TOD buildout scenario for each station, the existing densities for residential and commercial zones would be increased to reach the higher recommended TOD density for that use—specifically, recommended DU/acre and FAR for residential and commercial uses, respectively, from **Table B.1**. In addition, where additional land area is required to accommodate the new densities, land not utilized to its highest and best use (e.g., industrial uses or vacant land) would be converted to residential and commercial uses. For each station, both general plans (GPs) and specific plans (SPs) from local jurisdictions would specify the maximum allowable densities for each use.

Table B.2 presents a TOD buildout example for the new Greenwood Station currently under planning by LA Metro. Greenwood is one of six stations along the proposed new corridor that further extends LA Metro's existing Gold Line. The table provides—for residential, commercial, and industrial land use/density categories, respectively—(1) existing uses and densities (rows 1–5, 16, 19), (2) incremental uses and densities (rows 6–10, 17, 20) that are needed to reach (3) the TOD buildout densities and uses (rows 11–15, 18, and 21).

Greenwood is in a suburban locale and, as such, the residential target density used is 15.0 DU/acre (column 4, row 15), which is within the FTA recommended range presented in **Table B.1**. For commercial use, the target density used is 1.0 FAR (column 5, row 18), higher than that recommended by FTA in **Table B.1** due to much higher FARs generally prevailing in Los Angeles County.

The exercise of developing the TOD (and VC) buildout scenario is in part about increasing the density of incremental uses to the maximum allowable level possible. In **Table B.2**, for example, for incremental residential uses, both Mid/High (row 8) and Very High (row 9) density categories (i.e., multifamily) are increased to the maximum limit (22.4 and 35.4, respectively; column 4) within the density range allowed in that category (8–22 and 22–35, respectively; column 2), while keeping the low density uses (i.e., single family) at the existing level (row 7). These incremental densities result in, respectively, 1.56 million square feet (SF) and 2.76 million SF of new developed building and land areas (row 10, columns 6 and 8).

For incremental commercial (row 17), as shown in **Table B.2**, the land area is kept at the existing level (column 8) and 212,000 SF of new building area is added (column 6) to increase the FAR from 0.36 to 1.0 (column 5, rows 16 and 18). To accommodate these new high-density residential and commercial developments, the current building and land areas for industrial uses (row 20) are reduced by 859,000 SF and 2,760,000 SF, respectively. Finally, as shown in **Table B.2**, land uses pertaining to open space, governments/public institutions, and other public space would generally be left untouched (row 22).

Table B.2. Buildout scenario—TOD example (LA Metro Greenwood Station).

	Land Use/ Density Category [1]	Zoned Density Range (DU/ acre) [2]	Actual No. DUs [3]	Actual DU/ acre [4]	FAR [5]	Bldg Area (SF) [6]	SF/ Unit [7]	Land Area (SF) [8]	Assessed Value (AV) (in $M)		$/Unit (in '000$) [11]	$/SF [12]
									Land [9]	Building [10]		
	Existing Residential:											
2	- Low	0-8	819	6.5		1,152,174	1,407	5,488,428	$128.8	$87.1	$264	
3	- Mid/High	8-22	1,215	17.8		1,162,199	957	2,981,697	$78.8	$103.4	$150	
4	- Very High	22-35	187	30.5		151,064	808	266,796	$10.8	$14.5	$136	
5		*Total/Average*	*2,221*	*11.1*		*2,465,437*	*1,110*	*8,736,922*	*$218.6*	*$205.0*	*$98*	
6	**Incremental Residential:**											
7	- Low	0-8	0			0		0	$0		**$500**	
8	- Mid/High	8-22	900	22.4		900,000	1,000	1,742,888	$270		**$300**	
9	- Very High	22-35	830	35.4		664,000	800	1,017,277	$208		**$250**	
10		*Total/Average*	*1,730*	*27.2*		*1,564,000*	*904*	*2,760,164*	*$478*		*$276*	
11	**TOD Buildout Residential:**											
12	- Low	0-8	819	6.5		1,152,174	1,407	5,488,428	$215.9		$157	
13	- Mid/High	8-22	2,115	19.5		2,062,199	975	4,724,585	$452.3		$165	
14	- Very High	22-35	1,017	34.5		815,064	801	1,284,073	$232.9		$215	
15		*Total/Average*	*3,951*	***15.0***		*4,029,437*	*1,020*	*11,497,086*	*$901.1*		*$176*	
16	**Existing Commercial:**				0.36	121,539		333,676	$10.6	$9.9		$168
17	**Incremental Commercial:**					212,137		0	$0	$58.3		**$275**
18	**TOD Buildout Commercial:**				**1.0**	333,676		333,676	$10.6	$68.2		$204
19	**Existing Industrial:**				0.31	2,811,650		9,038,160	$167.0	$112.4		$24
20	**Incremental Industrial (Reduced):**					-858,650		-2,760,164	-$51.0	-$34.3		$24
21	**TOD Buildout Industrial (Reduced):**				0.31	1,953,000		6,277,995	$116.0	$78.1		$24
22	**Gov't/Inst./Open Space (Unchanged)**					67,070		7,882,504	$6.9	$7.5		
23	***TOD Buildout (Total)***		***3,951***	***15.0***	***1.0***	***6,383,183***	***1,020***	***25,991,261***	***$1,188.2***		***$176***	***$204***
24								***INCREASE IN ASSESSED VALUE (in $M)***	***$450.5***			

Source: LA Metro (2020).

B.3. Estimating Increase in Assessed Value

In general, real property values increase for new developments for three primary reasons: (1) increase in density, (2) increase in unit value, and (3) reassessment where the increase in AV can exceed the statutory limit. The previous section discussed how higher densities would generate significant new developments for the Greenwood Station TOD example presented in **Table B.2**. These new developments would be reassessed at a higher unit pricing for residential (i.e., $500, $300, and $250 per DU for Low, Mid/High, and Very High density, respectively) (column 11, rows 7–9) and commercial (i.e., $275/SF) (column 12, row 17), when compared to existing prices (i.e., $264, $150, $136 per DU for Low, Mid/High, and Very High residential, respectively, and $168/SF for commercial) (column 11, row 204; column 12, row 16).

As shown in **Table B.2**, with the new developments, the change in AV for each use (columns 9 and 10 combined) is:

- Residential: +$478 million (row 10)
- Commercial: +$58 million (row 17)
- Industrial: -$85 million (row 20)
- Total increase in AV for buildout scenario: $451 million (row 24)

For the Greenwood Station TOD, this $451 million AV increase would be the basis for applying, respectively, the ad valorem property tax and various non-ad valorem special taxes for TIF and SAD VC techniques.

As a check and balance, the higher density buildout scenario needs to be reviewed with respect to market absorption—whether there is sufficient population and employment base to absorb the proposed future growth. This involves reviewing the current and future demographics associated with the VC catchment area, which are shown in **Table B.3** for the Greenwood Station TOD example.

Table B.3. Current and future demographics—Greenwood TOD example.

Category	Timeframe	Area Covered from Station		
		1/2-Mile Radius	1-Mile Radius	2-Mile Radius
Population	Current (2019)	7,591	18,492	89,615
	Future (2069)	8,367	20,381	98,771
No. Households	Current (2019)	2,023	4,834	24,920
	Future (2069)	2,225	31,537	87,710
No. Employees	Current (2019)	4,439	16,228	63,552
	Future (2069)	4,826	17,642	69,091
No. Businesses	Current (2019)	336	940	4,138
	Future (2069)	354	1,022	4,499

For VC, it is ideal if all of the high-density new developments could be absorbed by the demographics within the VC catchment area. Falling short of that, the market absorption area can be extended further out progressively to draw additional population and employment for the new developments. In **Table B.3**, for example, in addition to the 1/2-mile TOD buffer zone, the demographics data are also presented for both 1-mile and 2-mile radii. As shown, the average household size (i.e., population divided by number of households) is forecast to remain relatively constant for the next 50 years. For the Greenwood TOD, if the number of dwelling units increases to 3,951 under the buildout scenario (**Table B.2**, column 3, row 15), based on average household size of 3.75, this results in a total population of 14,816 (3.75 times 3,951). **Table B.3** shows that this level of population falls somewhere between the 1/2- to 1-mile radius.

In terms of timeline, new developments associated with the TOD buildout scenario generally occur over a long period. The terms of VC financing (e.g., TIF- or SAD-backed bonds) are also generally quite long.[45] Therefore, the timeframe for future demographic projections should be just as long to provide sufficient time for market absorption to take place (in **Table B.3**, for example, a 50-year timeframe is used). Especially for VC opportunities that are open ended, the initial quantitative assessment is focused on the maximum potential that could be achieved with the assumption that the demand will be there at some point (and, less importantly, on the pace and timing with which they are reached).

B.4. Estimating Value Capture Revenues—Tax Increment Financing

Jurisdictions that have had TODs consider the organic increase in ad valorem tax revenues resulting from the increase in AVs as their own revenues, wholly at their discretion and without any consideration for investments in transit facilities that helped to generate them. To generate new revenue sources for infrastructure purposes using TIF, cities and counties must agree to contribute some part of their incremental revenues to the transit authority that is responsible for building the transit facilities.

California allocates a portion of ad valorem property taxes every year to cities and counties based on a pre-established formula (with the remainder going to the State). For the Greenwood Station TOD example, **Table B.4** presents how a 1 percent ad valorem tax is allocated to different tax rate areas (TRA) for Los Angeles County and the cities that are included within the 1/2-mile TOD buffer zone—in this case, the cities of Montebello, Pico Rivera, and Commerce. The table also shows the total current AV associated with each TRA and corresponding annual tax revenues due to the county and the cities.

[45] VC financing terms are typically 30 years but they can vary by State. In California, for example, community facilities district (CFD) bonds generally have 30-year term but TIF bonds can be as long as 45 years if linked to enhanced infrastructure financing districts (EIFD) described earlier.

Table B.4. *Ad valorem* tax allocation—Greenwood Station TOD example.

TRA	1% *Ad Valorem* Tax Allocation		Jurisdiction City	Current AV	*Ad Valorem* Tax Revenue (Annual)	
	City	County			City	County
06311	0.3441541120	0.0985862800	Montebello	$174,206,742	$599,540	$171,744
06330	0.3441541120	0.0985862800	Montebello	$517,583,960	$1,781,286	$510,267
06331	0.3441542550	0.0985862360	Montebello	$19,068,826	$65,626	$18,799
06338	0.3441460860	0.0985892140	Montebello	$23,131,141	$79,605	$22,805
07947	0.2435379590	0.0666711480	Pico Rivera	$475,339	$1,158	$317
07955	0.3561723780	0.1005718000	Montebello	$5,863	$21	$6
07965	0.3544174650	0.1010272080	Montebello	$49,402	$175	$50
07971	0.2435319890	0.0666711480	Pico Rivera	$140,895	$343	$94
12462	0.3739087920	0.0695135980	Commerce	$3,165,730	$11,837	$2,201
Avg.	**0.3441982767**	**0.0984351551**	**Total**	**$737,827,898**	**$2,539,591**	**$726,282**

It is important to note that these are annual tax revenues. If an agreement could be reached with the county and the cities, a portion of these tax revenues could be allocated every year for TIF purposes. In the case of the Greenwood TOD, for example, a potential tax allocation scenario could be a 50 percent contribution from the county and each of the cities for any new tax revenues derived specifically from the TOD buildout. The revenues thus allocated could be leveraged to secure the upfront debt financing with a term that can be as long as 45 years.

The final step in the quantitative assessment is to develop long-term cash flow estimates for both the full life cycle of the VC revenue potential and the potential TIF bonding capacity. This step requires additional information on the following:

- Timeframe of the VC revenue collection
- Timeframe for the TOD buildout, i.e., market absorption period discussed earlier
- Statutory property value appreciation rate allowed for existing properties
- Average turnover rate on existing properties and resulting average appreciation rate over and above the statutory rate to account for turnovers
- Discount rate for net present value (NPV) analysis

Table B.5 provides the TIF life-cycle cash flow based on a 45-year term for the Greenwood TOD example. **Table B.5** assumes the timeframe for the VC revenue collection is the same as the TIF bond term of 45 years, beginning when the detailed design of the Greenwood Station starts in 2028 (column 1).[46] The assumed timeframe for the TOD buildout is 20 years, starting with the opening of the Greenwood Station in 2035 (column 4). In California, the statutory AV appreciation for existing properties is currently limited to 2 percent per annum. An additional 1 percent in appreciation is added to the 2 percent limit to account for turnover. The ending AV each year (column 5) is calculated based on the initial AV (column 2) plus new developments (column 4) appreciated at 3 percent (inclusive of turnovers) minus the industrial properties that were removed (column 3) to accommodate the new developments. Incremental AV (column 7) in each year is calculated by subtracting the base year AV (column 6; equivalent to the total AV of all existing properties within the TOD buffer zone presented in **Table B.2**).

Table B.5 also shows the total ad valorem property tax revenues (column 8) associated with the incremental AV for each year, with specific allocations to the county (column 9) and the cities identified earlier (column 10) and based on the weighted average TRA tax rates presented in **Table B.4**. Assuming a 50 percent contribution of these revenues by the county and all cities, the total annual contributions are shown in the last column and the total nominal revenues over the 45-year VC life cycle are shown to be $167.4 million (second-to-last row). Using a discount rate of 3 percent,[47] this revenue translates into $65.4 million in NPV.

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[46] Assumes no voter approval is required. In California, as discussed earlier, TIF under an Enhanced Infrastructure Financing District (EIFD) vehicle requires no voter approval for district formation nor for TIF bond issuance.

[47] Three percent discount rate is typically used in project financing, which is considered a risk-free rate under the Capital Asset Pricing Model (CAPM) in project financing.

Table B.5. TIF life-cycle cash flow—Greenwood Station TOD example (in $M).

Year [1]	Initial AV [2]	Rmv'd [3]	New TODs [4]	Ending AV [5]	Less Base AV [6]	Incre-mental AV [7]	Total Tax @ 1.0% [8]	County [9]		City [10]		Total Contrib.
								Total (0.0984)	50% Contrib	Total (0.3442)	50% Contrib.	
2028	738			760	738	22	0.22	0.02	0.01	0.08	0.04	0.05
2029	760			783	738	45	0.45	0.04	0.02	0.15	0.08	0.10
2030	783			806	738	68	0.68	0.07	0.03	0.24	0.12	0.15
2031	806			830	738	93	0.93	0.09	0.05	0.32	0.16	0.20
2032	830			855	738	117	1.17	0.12	0.06	0.40	0.20	0.26
2033	855			881	738	143	1.43	0.14	0.07	0.49	0.25	0.32
2034	881			907	738	170	1.70	0.17	0.08	0.58	0.29	0.38
2035	907	(6)	35	964	738	226	2.26	0.22	0.11	0.78	0.39	0.50
2036	964	(6)	36	1,023	738	285	2.85	0.28	0.14	0.98	0.49	0.63
2037	1,023	(6)	37	1,085	738	347	3.47	0.34	0.17	1.20	0.60	0.77
2038	1,085	(6)	38	1,150	738	412	4.12	0.41	0.20	1.42	0.71	0.91
2039	1,150	(6)	39	1,218	738	480	4.80	0.47	0.24	1.65	0.83	1.06
2040	1,218	(6)	41	1,288	738	551	5.51	0.54	0.27	1.90	0.95	1.22
2041	1,288	(6)	42	1,363	738	625	6.25	0.61	0.31	2.15	1.08	1.38
2042	1,363	(7)	43	1,440	738	702	7.02	0.69	0.35	2.42	1.21	1.55
2043	1,440	(7)	44	1,521	738	783	7.83	0.77	0.39	2.70	1.35	1.73
2044	1,521	(7)	46	1,606	738	868	8.68	0.85	0.43	2.99	1.49	1.92
2045	1,606	(7)	47	1,694	738	956	9.56	0.94	0.47	3.29	1.65	2.12
2046	1,694	(7)	49	1,786	738	1,048	10.48	1.03	0.52	3.61	1.80	2.32
2047	1,786	(7)	50	1,882	738	1,145	11.45	1.13	0.56	3.94	1.97	2.53
2048	1,882	(7)	52	1,983	738	1,245	12.45	1.23	0.61	4.29	2.14	2.76
2049	1,983	(8)	53	2,088	738	1,350	13.50	1.33	0.66	4.65	2.32	2.99
2050	2,088	(8)	55	2,198	738	1,460	14.60	1.44	0.72	5.02	2.51	3.23
2051	2,198	(8)	56	2,312	738	1,574	15.74	1.55	0.77	5.42	2.71	3.48
2052	2,312	(8)	58	2,431	738	1,694	16.94	1.67	0.83	5.83	2.91	3.75
2053	2,431	(8)	60	2,556	738	1,818	18.18	1.79	0.89	6.26	3.13	4.02
2054	2,556	(8)	62	2,686	738	1,948	19.48	1.92	0.96	6.70	3.35	4.31
2055	2,686			2,766	738	2,028	20.28	2.00	1.00	6.98	3.49	4.49

Year [1]	Initial AV [2]	Rmv'd [3]	New TODs [4]	Ending AV [5]	Less Base AV [6]	Incre-mental AV [7]	Total Tax @ 1.0% [8]	County [9]		City [10]		Total Contrib.
								Total (0.0984)	50% Contrib	Total (0.3442)	50% Contrib.	
2056	2,766			2,849	738	2,111	21.11	2.08	1.04	7.27	3.63	4.67
:	:	:	:	:	:	:	:	:	:	:	:	:
2065	3,609			3,718	738	2,980	29.80	2.93	1.47	10.26	5.13	6.59
2066	3,718			3,829	738	3,091	30.91	3.04	1.52	10.64	5.32	6.84
2067	3,829			3,944	738	3,206	32.06	3.15	1.58	11.04	5.52	7.10
2068	3,944			4,062	738	3,325	33.25	3.27	1.64	11.44	5.72	7.36
2069	4,062			4,184	738	3,446	34.46	3.39	1.70	11.86	5.93	7.63
2070	4,184			4,310	738	3,572	35.72	3.51	1.76	12.29	6.15	7.90
2071	4,310			4,439	738	3,701	37.01	3.64	1.82	12.74	6.37	8.19
2072	4,439			4,572	738	3,834	38.34	3.77	1.89	13.20	6.60	8.49
2073	4,572			4,709	738	3,972	39.72	3.91	1.95	13.67	6.84	8.79
Total Nominal (in $M)									**37.21**		**130.17**	**167.38**
Total NPV (in $M)									**14.53**		**50.83**	**65.36**

B.5. Estimating Value Capture Revenues—Special Assessment District (SAD)[48]

Maximum VC revenue potential for SADs can also be estimated from the same incremental AV for the buildout scenario. This requires an understanding of basic local tax structure. For the Greenwood TOD, the local tax structure for TRA 6311 in the city of Montebello is shown in **Table B.6** below (same as **Table 8** in Chapter 5; refer to **Table B.4** for TRAs).

[48] This section is essentially the same as Section 5.4.2 but is repeated here for purposes of coherence in discussion with the Greenwood example.

Table B.6. Local tax structure (city of Montebello)—Greenwood TOD example.

Taxing Agency	TRA 6311 Tax Rate (2020-2021)
City of Montebello	0.197875
Community College	0.040162
LA County	0.000000
General *(Ad Valorem*—See **Table 7** in Chapter 5 for City/County Allocation)	1.000000
Metro Water District	0.003500
Unified Schools	0.097063
Total Effective Tax Rate	1.338600
Total Non *Ad Valorem* (Special Taxes Already Spoken For)	0.338600
Maximum Statutory Tax Rate	2.000000
Residual Tax Rate (Available for Additional Special Taxes)	0.661400

As shown, the total current effective tax rate for this area is 1.3386 percent, which is made up of a 1 percent ad valorem general tax rate and an additional 0.3386 percent of special taxes that are allocated variously to the city of Montebello, Los Angeles County, local school systems, and the water district. With the maximum statutory tax rate of 2 percent in California, this leaves a residual tax rate of 0.6614 percent available to impose new special taxes.

At a conceptual level, the maximum possible revenues from all special tax-based VC techniques can be estimated by applying this residual special tax rates to the incremental assessed value under the buildout scenario. This is shown in **Table B.7** (same as **Table 9** in Chapter 5) for the Greenwood TOD example.

Table B.7. Maximum potential for SADs—Greenwood TOD example.

Description	Greenwood TOD
Current Assessed Value	$738,000,000
TOD Buildout Assessed Value	$1,189,000,000
New Incremental Assessed Value Under Buildout Scenario	$451,000,000
Current Total Effective Tax Rate	1.34%
Maximum Statutory Tax Rate	2.00%
Residual Tax Rate Unspoken For	0.66%
Remaining Taxing Capacity at Buildout	**$2,976,600**
NPV at 5% for 30 years	**$45,800,000**

As shown, under the buildout scenario, the $451 million increase in AV can potentially generate almost $3 million additional revenues each year in special taxes if the total tax rate was taken to its maximum statutory limit of 2 percent. Using a 30-year term with a 5 percent interest rate more typical of SAD bond issuance, the corresponding NPV is estimated to be about $46 million—in comparison to $65 million under the TIF technique. As practical, for this step, alternative taxing scenarios could also be tested. For example, instead of taking to the maximum statutory limit, a maximum tax rate of 1.75 percent could be considered more reasonable and acceptable by the industry, making the residual tax rate 0.41 percent instead of 0.66 percent shown in **Table B.7**.

B.6. Estimating VC Revenues—Corridor or System Level (Multiple Nodes)[49]

The quantitative assessment described above is for a single node—i.e., TODs at a single transit station—which is a useful exercise particularly for the local jurisdiction where the node is located. Similar assessments can be made at multiple nodes to determine the VC potential at corridor and/or system levels. These broader assessments could be useful for Federal, State, and/or other regional agencies (including metropolitan planning organizations [MPOs] and transit authorities) that are engaged in providing major infrastructure projects that cut across multiple jurisdictions.

To continue with the LA Metro case, Greenwood Station is part of the Gold Line Eastside Extension that includes six new stations altogether along the new extended corridor. **Table B.8** provides potential VC revenue estimates for the entire corridor based on similar TOD buildout assumptions for each station as used for the Greenwood TOD case.[50] As shown, the corridor-level VC potential is much more substantial, reaching over $1 billion in nominal amount and over $410 million in NPV.

Table B.8. Corridor level assessment—LA Metro Gold Line extension example.

Corridor	Station	Current AV (Annual)	TOD Buildout AV (Annual)	Potential VC Revenues from Tax Increments (45-Yr Cumulative)	
				Nominal	Present Value
Gold Line Eastside Extension	**Atlantic/Whittier**	$876,190,272	$1,401,904,435	$107,018,771	$41,766,783
	The Citadel	$936,111,044	$1,497,777,670	$220,153,135	$85,920,331
	Greenwood	$737,712,566	$1,188,233,069	$167,400,962	$65,366,071
	Rosemead	$788,983,508	$1,262,373,613	$130,274,783	$50,843,030
	Norwalk	$675,696,691	$1,282,644,801	$146,926,627	$57,136,498
	Lambert	$991,520,494	$2,056,218,318	$284,189,113	$110,219,233
Corridor Total		*$5,006,214,575*	*$8,689,151,906*	*$1,055,963,392*	*$411,251,946*

[49] Some of the discussion in this section is covered in Section 5.5 but repeated here for the sake of coherence in detailing the Greenwood TOD example.

[50] Keeping in mind that the stations need to be sufficiently far apart and there is market potential to warrant TODs for each station.

Likewise, a quantitative assessment can be performed at the system level involving multiple corridors. The only difference here is that the implementation of each corridor may be phased with a different timeline and the cash flows would need to be staggered to reflect such phasing. **Figure B.2 (**same as **Figure 3** in Chapter 5) provides an example for all future corridors currently under construction or planning by LA Metro, inclusive of the Gold Line Eastside Extension (and Greenwood Station).
The example represents 45-year cash flows consistent with the TIF bond term, which are staggered based on the opening date of each corridor. Consistent with the other LA Metro examples, **Figure B.2** assumes that the TOD buildout would occur over a 20-year period (indicated by the black squares) starting with the opening date for each corridor. It also shows that the TIF district formation and, therefore, the collection of VC revenues could start a few years prior to the opening date to coincide with the construction start date for each corridor.

Figure B.2. Chart. Cash flow phasing under systemwide assessments—LA Metro example.

Line/ Corridor	No. Stations	Opening Date (Status)	2020-30					2030-40					2040-50					2050-60					2060-70					2070-80				
			2	4	6	8	10	2	4	6	8	10	2	4	6	8	10	2	4	6	8	10	2	4	6	8	10	2	4	6	8	10
Crenshaw/LAX	9	2022	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉							
Regional Connector	4	2022	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉							
Purple Line Extension	5 (Sect 1&2)	2024	◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉							
	2 (Sect 3)	2028			◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉					
Gold Line Extension	4 (Foothill)	2026		◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉						
	6 (Eastside)	2036							◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	
E. San Fernando Valley	14	2028			◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉					
Green Line to Torrance)	2	2030				◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉				
W. Santa Ana Branch	9	2042										◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉
Sepulveda Transit	4 (to Westside)	2034						◉	◉	■	■	■	■	■	■	■	■	■	■	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉		
	5 (to LAX)	2058																		◉	◉	■	■	■	■	■	■	■	■	■	■	◉

Source: LA Metro (2020). (Note: "◉" ***denotes the 45-year span in the VC assessment life cycle and "■" denotes the 20-year buildout period with the 45-year span.)***

GLOSSARY OF TERMS

***Ad valorem* –** An *ad valorem* tax is "a tax that is calculated according to value of property, based on an assigned valuation of a piece of real estate or personal property." In general, *ad valorem* tax increases (e.g., property tax) require stricter voter approval requirements than those that are not *ad valorem* tax (e.g., special assessments or tax surcharge).

Availability payment – Regular annual payment to the private concessionaire of a public-private partnership (P3) by the public project sponsor for the P3 term conditional on the availability of the facilities at the service level committed by the concessionaire.

Buffer zone – An area that is impacted by the existence of transit facilities and amenable for transit-oriented developments (TODs).

Buildout scenario – Maximum development potential that could be accommodated at a given value capture (VC) opportunity area (OA) based on maximum allowable densities by land uses consistent with the local general plan (GP) and specific plan (SP) linked to that OA.

Essential nexus – A test required to establish a direct cause–effect relationship between the proposed project and the exaction imposed on property owners and/or developers to pay for the public improvements needed by the project.

Exaction – A financial burden or other requirements a local government places on a developer to pay for all or a portion of the public improvements needed for the developer's project as a condition of project approval.

Floor area ratio (FAR) – Density measure for commercial and industrial uses calculated based on building area divided by land area for a given parcel.

General plan (GP) – Alternatively referred to as a Comprehensive Plan or Master Plan, a broad planning guideline to a city's or county's future development goals providing policy statements to achieve those development goals.

Residual tax rate – Tax rate below the maximum statutory rate that has yet to be applied, which is calculated by subtracting both the *ad valorem* general tax rate and all other currently effective special taxes from the maximum rate.

Revenue risk (or demand risk) – Risk taken by a P3 concessionaire dealing with its ability to generate project revenues from third-party users and its need to maintain the user demand levels to generate the revenues.

Rough proportionality – A test required to prove the need for the exaction amount from developer and/or property owner be roughly proportional to the impact created by the project.

Specific plan (SP) – A comprehensive planning and zoning document for a defined geographic region that implements the GP by providing a special set of development standards applied to that particular region.

Tax rate area (TRA) – Specific geographic areas with different tax rates that reflect different *ad valorem* tax allocations from the State and different voter-approved special tax rates relevant to local jurisdictions where the TRA is located.

Transit-oriented development (TOD) – High density developments in urban areas that maximize the amount of residential, business, and leisure space within walking distance of public transit system.

Turnover – A change in property ownership that triggers a reassessment of the property, which can result in assessed value increases that are over the statutory limit.

VC buildout scenario – See buildout scenario, above.

VC catchment area – Specific geographical extent or boundary of VC opportunity area; the higher the opportunity and growth potential, the larger the boundary.

VC opportunity area – Area where the value capture opportunity is relatively high; typically represented by a "node" where there is high growth potential, such as a major highway intersection or a major transit station.

VC propensity factor – Degree to which a given area can accommodate VC opportunities based on locational characteristics—e.g., urban areas that already have high-density, high-value properties have greater propensity than rural areas that are low density with low-value properties.

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