Transit Planning Practice in the Age of Transit-Oriented Development

By

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A dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy in City & Regional Planning in the Graduate Division of the University of California, Berkeley

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Abstract

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Globally, urban development near transit stations has long been understood to be critical to transit’s success primarily because it can contribute to ridership and improve the efficiency of transit investments. In the United States in particular, fixed-guideway transit’s land use-shaping capability has been an important justification and goal for transit investment. In fact, today’s U.S. federal funding policies increasingly focus on achieving transit-oriented real estate development near new transit infrastructure. However, the widespread implementation of transit and land use coordination practices has been considered an uphill battle. The academic literature suggests the most effective practice may be for U.S. transit planners to locate transit stations where pre-existing conditions are advantageous for real estate development or transit investments can generate the political will to dramatically alter local conditions to make them amenable to real estate development. However, prior to this study, no research had investigated the influence of real estate development considerations on U.S. transit project planning, particularly whether transit planners purposefully located alignments and stations as described in the literature.

Based on interviews with more than 60 transit planners and case studies of three transit projects, I found that transit planners have modified transit planning processes and project designs in numerous ways for multiple real estate development-related reasons on billions of dollars of transit investments. Integrated transit and land use planning is not necessarily the exception it was once considered. I found abundant examples across 18 U.S. regions of route realignments, station relocations, and station designs that were carried out in order to influence real estate development. Interviewees explained that some real estate development-related project elements escalated capital costs, increased operating costs, and reduced ridership forecasts relative to the alternative designs that were under consideration. The costs were thought to be worthwhile because of real estate development-related benefits that transit planners expected to accrue, such as more compact regional growth and increased ridership from station area real estate development. Yet, numerous interviewees also explained that their efforts had often resulted in less real estate development than they had anticipated.

I found that transit planning professionals’ theories regarding real estate development around transit helped explain why their expectations may not have been met. Through interpretive analysis of interviews with nearly 100 transit professionals—including transit planners, federal policymakers, and federal policy implementers—and a review of federal policy documents, I
developed a taxonomy of transit professionals’ theories-of-practice regarding station area real estate development. I found that many were oversimplified and decontextualized versions of academic theories. Such theories helped explain interviewee’s commonly-held view that transit-oriented development was likely around many, if not all, newly constructed transit stations.

Indeed, when transit planners rely on oversimplified and decontextualized theories about transit-oriented development, it can contribute to unrealistic development expectations that inspire real estate development-related elements of transit planning processes and project designs. Ultimately, the costs incurred to promote the anticipated development may not be justified by the transit-oriented development benefits that accrue. Ineffective theories and practices may contribute to an inefficient allocation of scarce transit funding resources and significant opportunity costs incurred directly by governments, transit agencies, private investors, and citizens.

This qualitative investigation establishes the existence of these theories and practices and can serve as the foundation for future research that more thoroughly quantifies the actual costs and benefits of real estate development-inspired transit planning practices across a representative sample of transit projects. If the overall scale of transit planning inefficiencies are found to be significant and worth addressing, policymakers can rely on findings from this research to adapt public policies. Also, researchers can rely on the findings to launch studies that will help us better understand how transit planners’ theories-of-practice emerge, disseminate, and persist. Further, scholars can engage with transit planners in reflective research to help them improve their efficacy, and ultimately, the efficiency of transit systems in the United States.
# Table of Contents

Abstract ........................................................................................................................................... 1
Table of Contents ............................................................................................................................. i
List of Tables .................................................................................................................................. ii
List of Figures ................................................................................................................................ iii
Acknowledgements ........................................................................................................................ iv
Introduction ..................................................................................................................................... 1
PART A: Setting the stage .............................................................................................................. 6
  Section A-1: The academic literature on transit’s impact on real estate development .......... 6
  Section A-2: Research design ................................................................................................... 22
PART B: Real estate development-inspired transit planning ....................................................... 37
  Acting on real estate development-inspired transit planning opportunities ....................... 38
  Diverse impacts on transit planning processes and project designs ................................... 40
  The goals of real estate development-inspired transit plan elements .................................. 45
  Transit project case studies ..................................................................................................... 49
  Implications of outsized transit-oriented development expectations ............................... 74
PART C: Real estate development-related theories of transit planning practice ....................... 76
  Insights from transit planning professionals’ statements .................................................... 76
  Inconsistent theories-of-practice and unrealistic real estate development expectations ...... 93
  The persistence of potentially problematic theories-of-practice ......................................... 95
  The prevalence of inconsistent theories across transit planning practice .......................... 106
Conclusion .................................................................................................................................. 107
Resources .................................................................................................................................... 113
Appendix A: New Starts policy overview .................................................................................. 123
List of Tables

Table 1 – Number of interviewees by gender ............................................................... 25
Table 2 – Number of interviewees by age ................................................................. 25
Table 3: Number of interviewees by professional experience in various types of organizations. 25
Table 4: Number of interviewees by type of experience ........................................... 26
Table 5: Number of interviewees who discussed real estate development-inspired adaptations to transit planning processes and project designs ........................................... 26
Table 6 – Instances of participant observation ........................................................... 31
Table 7 – Case Study Selection Criteria ...................................................................... 32
Table 8 – Real estate-related planning process and project design impacts ............... 45
Table 9 – Real estate development-related goals of planning actions ....................... 48
Table 10 – Attributes of case study settings and transit projects ................................. 49
Table 11 – Qualitative interpretation of case study findings ........................................ 51
Table 12 – Summary characteristics of proposed South/North arterial and freeway alignments extrapolated to the Interstate MAX project that was built ........................................... 55
Table 13 – Elemental makeup of example composite theories ..................................... 79
Table 14 – Theories regarding transit investments’ direct influences on real estate development ........................................................................................................... 81
Table 15 – Theories regarding factors that intervene in transit investments impact on real estate development ........................................................................................................... 83
Table 16 – Theories regarding the influence of land use plans and polices on real estate development ........................................................................................................... 86
Table 17 – New Starts’ real estate development-related scoring criteria ....................... 124
List of Figures

Figure 1 – Sample interview guide for a semi-structured interviews early in the process .......... 28
Figure 2 – Sample interview guide for a semi-structured interviews later in the process .......... 29
Figure 3 – “Segment 8: Kaiser to Expo Center” ...................................................................... 54
Figure 4 - Bush Turnpike Station West near the US-75 and President George Bush Turnpike interchange, Richardson, TX ................................................................................................. 64
Figure 5 – Scaleybark Station at the intersection of South Boulevard and Whitton Street, Charlotte, NC ..................................................................................................................................... 71
Figure 6 – New Starts Program’s organizational responsibilities and relationships ............. 126
Figure 7 – Transit planning process defined by New Starts funding policies ....................... 127
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Introduction

While prescriptive visions for real estate development proximate to new transit investments abound in an era focused on integrated transit and land use planning, we know little about the actual transit planning practices that professionals have undertaken to promote transit-supportive development. Based on interviews with more than 60 transit planners, this investigation found that efforts to encourage real estate development through modifications to transit planning processes and project designs had occurred on numerous occasions across 18 regions. These findings suggest that a significant change in our perspective on transit planning is justified. Integrated transit and land use planning is not necessarily the exception it was once considered. However, in spite of expending resources to coordinate transit investments with potential transit-oriented development—for example, adding capital costs, reducing operating efficiencies, and degrading ridership in their efforts to reroute transit lines or add new transit stations—numerous transit planners also said their expectations for real estate development had not been fully met. One explanation for the shortfall is that their expectations for transit-oriented development around the projects they planned were unrealistic. Through an in-depth analysis of interviews with nearly 100 transit planning professionals—including transit planners, federal policymakers, and federal policy implementers—and a review of federal policy documents, this investigation found that many transit planning professionals espoused some views about the relationship between transit investments and real estate development that are inconsistent with the academic literature on the topic and could lead planners to overestimate the potential for transit-oriented development around transit investments, including both the scale and timing of real estate development.

The application of oversimplified and decontextualized versions of academic theories across both transit planning practice and policymaking may contribute to underperforming transit investments—projects that do not generate the real estate development-related ridership or societal benefits that justified some of their costs—and an inefficient allocation of scarce transit funding resources in the United States. This may result in significant opportunity costs incurred directly by governments, transit agencies, private investors, and citizens. This project’s findings suggest that researchers should determine the actual scale of the inefficiencies that exist. If large, the transit industry, including policymakers, should set about addressing the efficiency of real estate development-related transit planning. This research serves as a broad foundation for such work.

Urban development near stations has long been understood to be critical to transit’s success (Kain 1999; Pushkarev and Zupan 1977; Meyer, Kain, and Wohl 1965). In addition, transit’s land use-shaping capability has been an important justification and goal for fixed-guideway transit investment in the United States (Giuliano and Agarwal 2010; Altshuler and Luberoff 2003; Cervero 1984). In fact, the Federal Transit Administration (FTA) was founded on the premise that transit could help shape urban form (Federal Transit Administration 2010a). Both Orski (1980) and Knight (1980) believed that new rail transit could not justify its high capital cost in transportation terms alone and had to demonstrate a positive impact on real estate development patterns to remain politically relevant.
Real estate development around new transit facilities, often referred to as transit-oriented development, has been promoted by multiple sectors as beneficial for communities. Planners have long touted the benefits of real estate development around transit for reasons such as: improved operating performance as more people use transit, improvements to property values and property tax receipts, improved economic performance of firms near transit, alternative transportation from costly and polluting automobiles, rejuvenating declining districts, improved housing and transportation affordability, and concentrated regional development that preserves open landscapes (Corbett and Zykofsky 1996). Similarly, transit-oriented development has been an explicit policy focus of the U.S. Department of Transportation for two decades (Federal Transit Administration 1994a), and today’s federal transportation policies increasingly focus on achieving “sustainability” and “livability” by promoting “transit supportive” real estate development near new transit infrastructure (Federal Transit Administration 2010b; US DOT Office of the Secretary 2011). According to the Federal Transit Administration (FTA), real estate development that may occur around transit projects confer considerable benefits:

“FTA believes the clustering of [real estate] development around a transit investment is a key measure of the value of the project. Transit projects can help local areas improve the livability and sustainability of their communities by increasing transportation choices and access to transportation services; improving energy efficiency, reducing greenhouse gas emissions and improving the environment; and improving the environmental sustainability of the communities they serve. Improved access to jobs and activity centers can contribute to local economic growth.” (Federal Transit Administration 2013a, 2009)

Integrated land use and transportation planning has been a longstanding objective, though its implementation in practice has often been considered an uphill endeavor (Cervero and Landis 1995; Bernick and Cervero 1997; Cervero et al. 2004; Dittmar and Ohland 2004; Renne and Wells 2005; Curtis, Renne, and Bertolini 2009). In fact, economic fundamentals may stand in the way of the realization of the goals of integrated land use and transportation planning. The academic literature suggests that transit may have a limited impact on real estate development in the United States in light of automobile ubiquity, an increase in non-work travel, and the limited role that transport plays in household decision-making. In addition, case study research has determined that even in the rare circumstances when transit confers significant accessibility gains, numerous factors can intervene in real estate development around transit investments.

For those pursuing transit-supportive real estate developments, the literature suggests it may be most effective to locate transit stations where pre-existing conditions are advantageous for real estate development or transit investments can generate the political will to dramatically alter local conditions to make them amenable to real estate development. Knight and Trygg (1977b), argue that any meaningful assessment of real estate development potential must be undertaken at a “site-specific” development project scale.

Research to date has not considered how transit project planners actually carry out particulars of practice described in the literature: assessing the potential for real estate development and

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1 In this dissertation, I refer to transit-oriented development (lower case and hyphenated) as a descriptor synonymous with other amorphous terms for relatively dense places that tend to have higher transit mode shares than less dense, auto-oriented places (Cervero 1994; Cervero and Guerra 2010; Ewing and Cervero 2010). Other such terms include transit-supportive development, sustainable development, or livable communities. I reserve the use of the terms Transit Oriented Development and TOD (capitalized without a hyphen) to describe the New Urbanist prescription for transit villages around stations popularized by Peter Calthorpe (1993).
aligning transit projects with that potential. Case studies of successful transit-oriented development and joint development have often alluded to the fact that transit plans might be adapted to promote real estate development outcomes (Curtis, Renne, and Bertolini 2009; Cervero et al. 2004). In fact, one of the most highly cited case studies of transit-oriented development in the United States, the Rosslyn-Ballston Corridor in Arlington, Virginia, is famed for having been an alternative transit route selected instead of the original proposed alignment in the median of a nearby highway. Research has also described factors that are supportive of real estate development (Dingemans 1978; Pucher 1988; Cervero 1993; Bernick and Cervero 1997; Parsons Brinckerhoff Quade & Douglas, Inc. 1996; Porter 1997; Cervero et al. 2004) and provided numerous normative prescriptions for how planners might design station area plans or promote joint development (Beimborn and Rabinowitz 1991; Calthorpe 1993; Nelson and Niles 2001; Dunphy 2003; Dittmar and Ohland 2004; Curtis, Renne, and Bertolini 2009). However, no prior studies of integrated transit and land use planning have approached the topic from a reflective practice orientation.

This study set out to fill a gap in our current understanding of transit planning practice: How have transit professionals gone about incorporating real estate development considerations into their transit planning practices? In particular, this research focused on how transit planners identify real estate development potential and how they design transit projects to optimize real estate development outcomes.

To reach conclusions, I relied on data collected from interviews, document review, and participant observation. I analyzed the data in case study format, through rigorous qualitative coding techniques using NVivo software, and through a comparison of findings to existing scholarly research on the topic.

This study’s focus on the everyday practice of planners and the theories they used to guide their practice is reminiscent of studies of urban planning practice that emerged in the 1980’s. For example, Baum (1983) described how 50 planners conceived of their own planning knowledge and Hoch (1994) interviewed and observed 29 planners to define how they interacted with staff, the public, and elected officials. Their work synthesized a view of professional practice from multiple, though not necessarily representative, case study observations. On a closely related topic, Wachs (1989; 1990) used interviews and reviewed project documentation to map transit planners’ involvement in the transit planning process and to develop an understanding of their motives and acts as they interpreted transportation demand models. This worked helped federal policymakers update their demand model evaluation policy and established a hypothesis about the breadth of transit planning practices. The hypothesis served as the foundation for Bent Flyvbjerg’s extensive research on mega project capital cost overruns (Flyvbjerg, Holm, and Buhl 2002).

Likewise, this research establishes the existence of certain theories-of-practice and transit planning practices, and hypothesizes that they may contribute to significant inefficiencies across U.S. transit investments. Furthermore, this investigation has identified several other avenues for research related to transit planning practice, the political economy of transit funding, and unstudied theories about transit-oriented development put forward by interviewees.

While some of the insights of this study have immediate implications for practice, the insights gained from this investigation are specific to the people and sites I studied and serve primarily as a springboard for generalizable research. Given the research questions that were asked and the
research design that was employed, this study has been able to describe how society has functioned in several instances and hypothesize how it might function more broadly. My methods provide proof of existence only (Lucas 2012). While I discuss quantities of transit projects or interviewees in my communication of the data, I did not employ a methodology to gather a representative sample such that the quantities speak to the society at large. I describe the quantities to give more or less credence to certain hypotheses about how society might work such that scholars can focus on more fruitful avenues for future research. Another research design will need to be pursued to determine the extent to which the observations made by this dissertation represent the total population of transit professionals and transit projects.

Dissertation overview

Following this introduction, I set the stage for sharing this study’s findings in Part A. In Section A-1, I discuss the academic literature regarding transit investments’ impacts on real estate development in the U.S. context. I pay particular attention to urban economic theory. The literature suggests that real estate development spurred by increased transit access is unlikely in the United States in light of automobile ubiquity, an increase in non-work travel, and the limited role that transport plays in household decision-making. Even when incremental access is substantial, a panoply of other factors must align for real estate development to occur around transit. In many cases, the literature suggests that although real estate development around transit could be attributed to the policy changes and other infrastructure investments stimulated by transit investments, that development would have happened regardless of the transit investment had those factors been otherwise addressed; that is, transit was a second-order influence. The literature suggests that designing transit to align with places where real estate development is likely irrespective of transit may be the optimal strategy when one goal of a transit investment is to see transit-supportive real estate development emerge.

In Section A-2, I discuss my research methods and how I arrived at the conclusions of this study. I first describe my two theoretical approaches to transit planning practice, which are the distinguishing characteristics of the research found in Part B and Part C of the dissertation. I also discuss my data collection processes, which included interviews, document review, and participant observation. I then discuss my data analysis, which consisted of case study analyses and interpretive analysis of interview data using NVivo’s qualitative research software.

Following the description of methods, I share findings from my investigation of planning practices and their outcomes. In Part B, I describe the impacts of real estate development considerations on transit planning processes and project designs in 18 regions. Interviews with more than 60 transit planners revealed that the timing of entire projects and modifications to transit projects’ routes, station locations, and station area designs were intended to promote real estate development. Part B also includes in-depth case studies of three transit projects where transit planning processes and project designs were influenced by real estate development considerations. The cases demonstrate that real estate development-inspired planning processes and project designs required planners to make complex tradeoffs. For example, Portland planners selected a route for the Interstate MAX project based on the inevitability of real estate development around stations even though a less expensive, higher ridership alternative existed. In each case study site, transit planners’ costly and sometimes time-consuming efforts to support transit-oriented development did not yield the anticipated real estate development in the expected timeframe.
In Part C, I discuss one explanation for the disconnect between transit planners’ expectations for transit-oriented development around the projects that they planned and the underwhelming results they observed: their theories-of-practice may lead them to overestimate the potential for real estate development around transit stations. I describe and categorize the theories of nearly 100 transit planners, federal policymakers, and FTA policy implementers regarding the influence of transit investments on real estate development and the potential for real estate development around transit. I describe a taxonomy of all the theories that sources stated as they explained the relationship, noting statements whether it was said by one interviewee or stated by 50 interviewees. I describe nearly 70 distinct theories. I then describe how many practitioners’ theories were reminiscent of the academic literature but often inconsistent as stated. I found that more than half of the theories in the taxonomy were oversimplified and decontextualized versions of academic theories that could lead practitioners to overestimate the potential for transit-oriented development. Further, as the basis for future research, I discuss how my evidence suggests the inconsistent theories might emerge, persist, and perpetuate.

Finally, I conclude the dissertation with a discussion of the findings and make suggestions for future research and policymaking. I recommend that we first conduct follow-up research to understand the scope of the inefficiencies resulting from the practices described by this study. If the inefficiencies are found to be significant, I also provide suggestions for steps that can be taken to reduce the gap between research and practice and thereby improve the outcomes of transit planning practice in the United States.
PART A: Setting the stage

In the first half of this section, I describe the academic literature pertaining to U.S. transit investments’ impact on real estate development. I focus on urban economic literature and studies of transit-oriented development, which suggest real estate development around transit investments is most likely to occur when transit planners align stations with sites that are ripe for real estate development. In some cases, the real estate development would happen even without the transit investment while in other instances the transit investment generates the political will to address impediments that have constrained development to that point.

In the second half of this section, I discuss the study’s research design. I detail the theories, data collection methods, and data analysis methods that I employed to reach conclusions. I discuss the fact that this project’s sampling process was not intended to produce findings that are generalizable to the entire population. Rather, this study has proven the existence of the social structures that are described within this dissertation. In addition, I discuss the rigor with which the data collection process and analysis allow me to reach the conclusions that I have drawn from the evidence.

Section A-1: The academic literature on transit’s impact on real estate development

In this section, I consider the literature regarding the effect of transit investments on real estate development, concluding that for real estate development to occur around modern U.S. transit investments, stations must be aligned with locations where development was already likely to occur or locations where the construction of stations is an inducement of sufficient political will to address the inhibitors of real estate development that previously existed in that location. Urban economic theory suggests that transit will have an impact on urban development only under certain conditions that are infrequently present in U.S. cities. Reflecting the theory, empirical research has seen mixed results with some transit station areas experiencing price uplift and even development while other station areas have seen little price appreciation or development. Research on conditions that are supportive of development suggest that it may be most efficient to align transit with sites that are ripe for real estate development irrespective of a transit investment. Overall, however, the literature suggests that transit will have little direct impact on land use in the U.S. context and that in strong markets it may have second order impacts on land use by justifying changes to factors that previously constrained the supply of real estate development, such as local land use policies.

Explanatory models of transportation’s impact on urban development

This Chapter focuses on explanatory theories of transportation’s influence on real estate development. While widely discussed in the literature, descriptive models of past and present urban forms may be misleading predictors of impacts of transportation investments on urban development (Meyer and Gomez-Ibanez 1981). They tend to disregard the underlying mechanisms by which transport influences urban development. Explanatory models fill this role.

Almost all explanatory economic models of urban development rely on transport costs to define the spatial relationships of residents, firms, and regional geography. To start, theory suggests that land rents are based on a competitive land market in which users who pay the most will gain rights to productive use of land; therefore, the most productive land achieves the highest rent.
(Ricardo 1891). Productive use of the land includes transmitting people and goods to other locations. A land user’s ability to pay increases as transport costs decrease; thus, land with lower transport costs to the marketplace will be higher priced (von Thunen 1966). More generally, land with high accessibility—the relative ease of moving between locations of interest—will have higher value compared to less accessible land (Giuliano 2004). Because transport infrastructure consists of networks, land values are typically higher closer—but not too close—to network access and transfer nodes like intersections, highway onramps, or transit stations. Being too close to the negative externalities of transport, like noise and pollution, may have unfavorable impacts on land values.

Land values are indicators of potential urban form changes for multiple reasons. First, land values indicate people’s willingness to compete for a particular location. If attractive locations have capacity, intensification or change of use may occur. If attractive locations do not have adequate capacity, then new square footage may be added or be built to replace the existing built form. In addition, land values are often a component of value considered in property tax valuations. As land values rise, the tax burden on land owners rises and at some point they may choose to abandon or make more productive use of their land.

In some of the earliest work on the subject of transport’s influence on land use and urban development, theories on location and site rent in rural settings (von Thunen 1966; Christaller 1966; Ricardo 1891) were adapted to central business district-oriented urban models by Alonso (1964), Mills (1972), and Muth (1969). These theories suggested that firms and residents make budget tradeoffs between transport costs and land costs. The resulting bid-rent curves of different land users explain general observations of employment centrality, declining densities as one moves further from the central business district (CBD), and diminishing land costs as distance from the CBD increases. Based on these simple models, one can make some predictions about urban development as transport costs rise or fall. Of particular interest, the models predict that cities spread out as transport costs decline.

Mohring (1961) used the monocentric model to demonstrate how land markets would respond to the introduction of a radial transport investment. Assuming all else equal, certain locations would receive benefits and others would lose value as land markets adjusted to new accessibility gradients. Relaxing some constraints of the model demonstrated how densities, urban boundaries, trip frequency, and overall urban form changes would respond directly to the new accessibility provided by the infrastructure investment. As with all of the CBD-oriented models, Mohring’s model made assumptions that allowed for an analysis that ignored other location decision components, the stickiness of parcelization, the durability of building stock, and other factors.

Most models assume that residents make location decisions based, for the most part, on accessibility. However, theory suggests that firms experience other benefits that inform their location decisions. The firm location literature of Weber (1969) and spatial economy theory of Isard (1956) add a finer grain dimension to discussions of urban form and have been the basis for newer and broader models. In general, the models describe a tension between locating firms close to one another to exchange outputs more easily and locating firms farther away from one another to be closer to production inputs. In his assessment of where firms will theoretically locate, Weber considered input-output transport costs and labor costs to determine a least-cost firm location. As transport costs change, potentially through the addition of transport capacity or the congestion of an existing transport link, optimal locations may change. Krugman (1993)
added to the theory by including economies of scale in the analysis. While a firm may have
started producing a particular good because of a local market, economies of scale may encourage
firms to produce even more of the same good in that market rather than distributing their
production across other markets. This helps explain how, amongst other factors, declines in
transport costs have allowed certain geographies, as well as their incomes, to grow
disproportionately. It also explains an upward trend in firm size as transportation costs have
declined.

Economies of scale that occur external to firms are considered agglomeration economies of
scale. The literature points to three types of agglomeration benefits: transport, labor, and
information (Glaeser and Gottlieb 2009).

1. Transport: Today, the urban role in reducing transport costs seems to be more important
   for service firms. Face-to-face contact remains costly whereas freight costs have declined precipitously (Glaeser and Kohlhase 2003). Kolko (2000) determined that business service firms are much more likely to locate near sectors that are abundant in potential customers or input suppliers.

2. Labor: Research has suggested that dense agglomerations provide labor market pooling
   so that workers can shift between shrinking and growing firms but the empirical evidence
   supporting this claim is insufficient to reach conclusions (Glaeser and Gottlieb 2009).

3. Information: More conclusive evidence has been found that suggests cities exist and
   grow because of information transfer benefits of proximity (Glaeser and Gottlieb 2009).
   Research has found that skilled industries locate in urban areas, city-wide skill levels
   predict urban growth, and city-wide skill levels predict worker income.

In their analysis, Chatman and Noland (2013) combine these effects as they considered the
ability of public transit to contribute to physical agglomeration, more clustered and higher-
density employment that offers agglomeration benefits and also provides more physical space for
urban places to grow.

In sum, these theories describe why various land users would value particular locations. Though
other factors may influence outcomes—for instance, existing land uses or regulatory constraints
on the use of the land—the extent to which they value a particular location after a transport
investment is predictive of whether or not urban development will occur. Ultimately, Giuliano
(2004) suggests that all of these theories are flawed but remain useful for both stylized
understanding and anticipating the directional impacts of investments in our transport system.

Transport Innovation and Model Predictions
Theoretical models have been able to help explain most macro trends in urban development that
have arisen in response to transportation innovations.

Technological advances in transportation systems have yielded progressively lower
transportation costs (Glaeser and Kohlhase 2003; Garrison and Levinson 2006). Models suggest
that lower transport costs will be revealed in urban development as some activities disperse
across the landscape and others are able to cluster to achieve agglomerative benefits.
Decentralization of residences and many types of employment has been a noted trend (Muller
2004). Though households and firms respond to many things besides transport costs—for
instance, tax rates, school quality, amenities, etc—they seem to have reacted by both sprawling
outward and concentrating upward, just as models predict, after the introduction of streetcars, automobiles, interstate highways, and each subsequent innovation that lowered transport costs and increased the reach of transport systems. In fact, Wachs (1984) suggested that interurban rail lines of the late 1800s and early 1900s in Los Angeles were a primary motivator of residential dispersal and established the landscape that inspired plans for Los Angeles’ famed highways.

In addition, the invention of electric trolley motors enabled the development of electric elevators (Jackson 1987). Electric elevators had greater reach than piston elevators and greater reliability and lower cost than steam elevators. The lower cost of vertical transport corresponded with growth dynamics in U.S. cities. The verticalization of cities allowed for agglomeration of certain forms of employment at the same time as streetcars enabled the development of residences across wider areas in more dispersed configurations. In fact, Harrison (1978) found positive correlation between streetcar line length per capita and the share of single-family dwellings in U.S. regions in the decades just preceding and following the turn of the 20th century. The confluence of events led to a standard U.S. urban form of dense centers and broad residential territories.

While employment has tended to decentralize since the advent of the interstate highway system, it has tended to agglomerate in sub-centers (Cervero 1989; Garreau 1992). Models would suggest that this is a response to two countervailing forces (Giuliano and Agarwal 2010). As residences sprawled outward in response to lower and lower transport costs, some firm location decisions responded to new geographies of labor accessibility by moving outward as well. At the same time, firms experience positive spillovers from agglomeration and therefore relocate from the CBD to sub-centers where they benefit from transport, labor, and information benefits.

Based on changes in employment and residential locations, cities have seen incredible redistributions in land values. Models suggest that relative increases in accessibility at a particular location will result in higher land values and, per Mohring’s (1961) predictions, urban land values have been redistributed as locations become more or less attractive. This would explain how some locations once favored because of waterway or freight rail access have become derelict as logistics firms have shifted their focus to freeway-oriented sites that have more access to trucking routes. Likewise, it explains how employment sub-centers have seen tremendous growth as central cities stagnate or shrink. It also helps explain the findings of Chatman et al (2011) that rail station investments had positive correlations with home prices close to rail transit stations and negative correlations with home prices further away.

**Model Implications for Modern Transit**

Theoretical models suggest that transit will not have an impact on urban development unless it provides significant accessibility benefits to land. However, this is not a likely prospect in light of automobile ubiquity, an increase in non-work travel, and the role that transport plays in household decision-making. Theoretical models suggest that transit could aid agglomeration benefits but this is not well understood.

Meyer and Gomez-Ibanez (1981) concluded that new transit capital investments do little to alter regional travel costs in instances where significant automobile infrastructure has already been developed. The ubiquity of car access in U.S. cities suggests that transit, which has less flexibility than the automobile, will have little impact (Giuliano 1995). Barton (1992) suggests
that no transit strategy will impact urban development without considerations of transit’s relative convenience including policy provision to address automobile accessibility, improvements in bike and pedestrian connections to transit, and transit network integration. Cervero (1984) cited the relative accessibility benefits of rail transit and automobiles when he suggested that Santa Clara County’s light rail could have little impact on the urban development of Silicon Valley because it was proposed for corridors where sprawling land uses with abundant free parking dominated the landscape and, in one line’s case, was being planned in concert with two new expressways flanking the transit route. In instances where the car remains an inexpensive point-to-point transportation option, transit and its feeder systems will remain weak competitors for mode share and have little impact on urban development.

Conversely, new transit investments can play a role in shaping urban development in locations where transit provides significant accessibility benefits—most likely because automobile infrastructure is constrained. For instance, central cities that have not had significant highway interventions or inaccessible pockets in auto-oriented cities could see major accessibility gains with the provision of transit. Additionally, policies could be implemented to manage or direct congestion toward certain geographies such that transit provides greater relative access and produces the anticipated impacts. In addition, some researchers suggest that fully pricing automobile travel would change the calculus that yields urban form relatively immune to modern transit investments (Giuliano 1995) and theory would suggest that it could help transit impact urban development in cities that are currently auto-dominated (Giuliano and Agarwal 2010).

That said, Giuliano (1995) points out that our transit systems have been built to serve agglomerations of employment and it will be difficult to adapt fixed-guideway transit systems to serve the non-work destinations that have developed with the automobile. Meyer, Kain and Wohl (1965) were some of the first to point out that declining densities perpetuated by rising automobile use were leading to declining transit patronage and the demise of U.S. transit services. Nelson and Niles (1999) suggest that travel modeling and transit planning has not accounted for significant changes in the non-work trips that make up the vast majority of trips. For instance, retail trade areas have been defined based on the automobile and only in certain markets are land users willing to adapt to a transit-focused transport system.

In a similar argument, Meyer and Gomez-Ibanez (1981) suggested that transport plays a smaller role in household location decision-making than we give it credit. Theory’s assumptions regarding decision-making criteria ignore school quality, public services, tax rates, safety, and others factors that studies determined have considerable influence on household location (Giuliano, Agarwal, and Redfearn 2008). In fact, Webber (1980) believed that fixed-guideway transit was a thing of the past because technologies like phones, cars, and suburbs were preferable to and divergent from fixed-guideway transit.

Agglomeration benefits of transit could be a countervailing force that would support transit’s role but such benefits are not well understood. Without a feasible way to calculate the impact, rail benefits assessments typically do not calculate potential agglomeration benefits of proposed transit investments (Van Wee 2007). However, theory suggests that transit could enable agglomeration in ways that other technologies cannot. First, by allowing more people to access a particular piece of land and, second, by reducing the space required for transport infrastructure (e.g., automobile parking) transit could enable more dense cities and greater interaction between individuals that generates spillovers and real economic growth (D. G. Chatman and Noland 2013).
Empirical Research

In addition to theoretical speculation, there has also been considerable empirical literature on transit’s impact on land uses. Two methods predominate. First, case studies of observed land use changes can attempt to disentangle transit’s impact on those changes. The second method, measuring land values, is considered a more direct measure of transit’s impact on land use.

Both methods suffer from a series of issues. The spatial limits of observation, timeframe of observation, geography of real estate markets, and changes in public policy over the observed before and after period all complicate an assessment of transit’s accessibility benefits and impact on urban development (Giuliano and Agarwal 2010). As an example of the complexity of these issues, consider selecting the appropriate timeframe for measuring land use impacts. Part of the issue is that changes may occur in anticipation of a transport investment, only after the transport investment is linked in a certain way to the transit network, or long after an investment has been made (Giuliano 2004). Given this timespan, it incredibly difficult to control for other influences on urban development and isolate the effect of transit. A study must accurately account for policy, market, and other changes that happened along the line at various times from project conception up to the date of study.

Assuming that land value studies allow researchers to systematically control for more factors than case studies, there are also questions about the quality of our measurement tools to accurately discern land value changes. All three of the typical approaches for measuring the effects of transit on land values—hedonic price models, matched pair comparisons, and repeat sales ratios—have methodological issues (Giuliano and Agarwal 2010). For instance, Redfearn (2009) suggests that hedonic models used to determine the land value impact of transport investments do a poor job because models are difficult to specify, assume homogeneous marketplaces, are unstable, capture only a snapshot of land use policy impacts, and use internally biased, small sample sets. With regards to specification, the models must account for numerous disbenefits (e.g., traffic, noise, air pollution) that are also capitalized into land values differentially across the landscape. Models must also control for other influences on land values such as access to amenities, school quality, highway access, land use regulation, economic conditions, property market cycle, crime, perceptions of crime and other factors. And while theory suggests that commercial land uses will be influenced by accessibility, these methods are also most commonly used to study residential property. That is partly because the analysis is not complicated by the agglomeration benefits that will be simultaneously capitalized into commercial land values and the fact that the prevalence of residential property transactions provides more robust statistical samples.

Debate also arises regarding the inflection point at which land use impacts measured by land value changes lead to real estate development. Giuliano (2004) suggests that the accessibility and land value changes are not sufficient enough to change urban form. Certainly there are locations where rents may double based on transit’s accessibility impacts and, while land values appreciate, the higher rents in transit served locations cannot justify the profit margins necessary for new development to occur.

Rail Impact studies

Urban rail investments subsided in the 1920s and were precluded by the depression, WWII, and the rise of the automobile in the postwar years (Jones 2008). While Toronto built its first subway lines in the 1950s, the San Francisco Bay Area was the first post-war U.S. city to pursue a major
transit investment with the establishment of BART in 1957. Excitement surrounding costly new transit proposals spurred a campaign for Federal funding support which capitalized heavily on reports from Toronto describing high rise development along the new Yonge Street Subway corridor (Knight 1980; Orski 1980). Proposed transit legislation was sold to congress based on transit’s ability to help “shape as well as serve urban growth” and the Urban Mass Transportation Administration was established (Federal Transit Administration 2010a; Altshuler and Luberoff 2003).

Responding to its mission to shape urban development, UMTA sponsored rail impact studies of the systems that the program had funded in the 1960s and 1970s. Studies found that first generation U.S. systems—those built in the 1960s and 1970s—had little impact on urban form (Knight and Trygg 1977a; Webber 1976). While Webber (1976) decried BART based on his case study research, he cited the growth of downtown office real estate as one of its few urban development impacts. However, he found the logic circular because BART was justified by the demand for more office development in downtown San Francisco. In his loose matched pair comparisons, he found that San Francisco had little more downtown office development than other cities. Subsequent research revealed that, in BART’s case and many others, downtown office growth was a small percentage of overall regional real estate development in the sector (Knight 1980) and some of the square footage growth could be explained by the growing consumption of square feet per employee in modern workplaces (Kain 1999). In their global assessment of transit’s land use impacts, Knight and Trygg (1977b) concluded that transit investments were one factor that helped shape land use patterns but that “transit cannot create desired land use patterns by itself” (p. 210).

With regard to land values around first generation systems, system impact studies have yielded mixed results. Damm et al’s (1980) hedonic study found a modest impact of distance from proposed Washington Metro stations on property sales prices. Likewise, Landis et al (1994) found a positive price premium for each foot closer to a BART station in two of the three counties served by the system at the time. Bowes and Ihlandfeldt (2001) used a hedonic regression model to find that MARTA rail transit station proximity had a greater effect on Atlanta home prices than either crime or retail proximity once one looked beyond the immediate station area where prices were negatively impacted by transit. On the other hand, Gatzlaff and Smith (1993) found no spatial correlation using a repeat sales index or a hedonic model for single-family properties around proposed Miami Metrorail stations. Data availability and controlling variables differed significantly across the samples and could account for some of the differences in results. In addition, conditions in the study areas were significantly different. Fundamental theories of land values and location choice discussed above would suggest that different outcomes would be anticipated for Atlanta, Miami, San Francisco, and Washington D.C. given their very different levels of auto accessibility, geography, and the alignments of the various transit interventions.

In spite of high expectations that second generation rail systems, like that in San Diego, would learn from prior experience and outperform the land use impacts of their predecessors (Orski 1980; Knight 1980), it was found that San Diego’s trolley was a minor consideration for developers and that other market forces were directing growth to areas unserved by the trolley investment (SANDAG 1985). Subsequently, Landis et al (1994) found a positive premium for San Diego transit station proximity using a hedonic model but it was not clear that residential development was attracted to the line. Most recently, Duncan (2010) found that station
proximity’s positive impact on condo prices was dependent on the quality of the pedestrian environment around San Diego stations. On the other hand, Landis et al (1994) found that Sacramento’s LRT had no significant effect on prices. Knaap et al’s (2001) hedonic model for Portland properties found positive land value impacts of Hillsboro line station location announcements. A study by Hess and Almeida (2007) used multiple methods to identify a positive premium effect for LRT proximity on Buffalo property assessments. More recent case studies of three light rail projects implemented in the 2000s have found that most development that occurred along light rail transit lines, measured in square feet, materialized in employment nodes—especially downtown and also regional sub-centers (Fogarty and Austin 2011). While the lines may have influenced residential land values, few instances of residential development were notable. Again, differences in control variables (e.g., the lack of highway access variables in the Buffalo study) and a diverse set of study area conditions are logical explanations for the variation in findings for these second generation systems.

While most studies have used hedonic models, some of the more recent rail impact studies used a diverse set of methods to improve their assessments and, again, found mixed results. Chatman et al (2011) used a hedonic model using the change in same-parcel sales prices to determine that New Jersey’s River Line had a positive impact on some properties but the cumulative land value effect was negative to neutral. In Chicago, where a robust transit network exists, McMillen and McDonald (2004) used hedonic and repeat sales methods to determine that residential sales prices were positively influenced by the extension of the L-system to Chicago’s Midway Airport. In Los Angeles, where rail has only recently been reintroduced, Redfearn (2009) used a hedonic and multiple locally weighted regressions to determine that the Metro Red and Gold lines had inconclusive or no impact on residential sales prices.

As noted above, most of these studies focus on residential property because they trade more often, making data more readily available, and any proximity benefit can be attributed to transit whereas agglomeration benefits will also be capitalized into commercial property values. Thus, this research cannot speak to many of the notions regarding commercial properties that are suggested by the general theories of transportation and land use. With respect to residential properties, both Debrezion et al (2007) and Giuliano and Agarwal (2010) conclude that the extensive literature does not unambiguously demonstrate that transit access is capitalized into land values in modern U.S. cities. This may be a function of research methods. Then again, it may be a reflection of the underlying theory that suggests that accessibility will be capitalized but that the capitalization may be small, positive, or negative. That said, even at the high end of estimated land value impacts, the capitalized values may reflect insufficient changes in markets to provoke real estate development. It would seem that the theoretical models suggest that transit will have minimal impact on residential accessibility in our auto-oriented U.S. cities and empirical evidence has been unable to reject the hypothesis.

**Misinterpreted empirical evidence**

Even in the face of evidence that transit is having mixed impact on land values and modest impacts on real estate development, we tend to insist that transit will have an impact on U.S. urban development because it once did in the U.S., because it still does in international cities, and because we occasionally see hoped-for land use changes occurring after transit is implemented. A quote from the author of the Urban Mass Transportation Administration’s 1970’s-era transit investment evaluation policies reflects this rhetoric:
“Today, rail facilities are admittedly less effective in shaping land use patterns and guiding locational decisions than in the pre-automobile era. This is because in a modern metropolitan area, served by a dense network of high-speed freeways, rail transit can only marginally increase regional accessibility or improve mobility. But the experience of Canadian cities and evidence now emerging from certain U.S. cities suggests that even today rail transit can have a strong influence on the location, intensity and timing of new development, especially when it is supported by positive development incentives and coordinated land use/transportation planning” (Orski 1980, 200).

Perhaps one of the most celebrated international examples of transit’s impact on urban development and one referenced by Orski in the same resource quoted above, Toronto’s Yonge Street subway, offers a sobering note for those who believe that transit can have a profound influence on real estate development. The political debate surrounding federal transit funding and much of the early research on transit’s impact on urban development in the U.S. was predicated on case studies of Toronto’s Yonge Street subway in the 1950’s (Orski 1980; Cervero and Seskin 1995; Knight and Trygg 1977a). Cervero (1986, 297) declared that before and after photos of the Yonge Street corridor are “graphic testaments to transit’s city-shaping abilities.” Some of the earliest evaluation studies suggested that much of Toronto’s development, both employment and residential, occurred within walking distance of the new transit facilities (Cervero and Seskin 1995).

However, Toronto’s experience in the 1950’s did not continue through the 1960’s and urban growth in the 1980’s and 1990’s mirrored sprawling U.S. urban development trends (Filion and Mcspurren 2007). For one, Toronto’s real estate market was so robust in the 1950’s that mere zoning relaxation around stations had encouraged development and obviated the need for joint development and other incentives (Cervero 1987). The Yonge Street Subway stations had provided the rationale to relax land use controls in a strong submarket where it was infeasible otherwise (Knight and Trygg 1977b). Toronto’s transit investment was the most significant public investment in the region at that time and therefore it behooved its promoters to claim that transit, not zoning relaxation, had motivated the land use changes (Filion and Mcspurren 2007). Absent a comparable property boom and given the relaxation in land use policies that have occurred in greater Toronto, the researchers found that zoning relaxation around stations has not had the same influence on development that it did in the 1950’s. This is in spite of the fact that subsequent transit investments in Toronto significantly improved transit’s network-based accessibility advantages.

It would seem that Toronto’s experience may reflect the concept of transit as a Trojan horse rather than the concept that transit influenced land values and produced a direct impact on urban development. As discussed in the next section, a great deal of the literature suggests that development around transit is only feasible if certain supportive conditions are present, often irrespective of transit access.

Supportive Conditions for Transit’s Impact on Urban Development

The mixed results of empirical work can be explained, at least in part, by the level of accessibility transit investments have generated in the diverse circumstances in which projects have been implemented. To complicate matters for those seeking to predict a transit investment’s probable impact on urban development, case study work has determined that even
if transit confers significant accessibility gains, a panoply of critical factors must be present for transit to have an impact on land use.

Different researchers have identified a varied set of factors that influence real estate development around transit, though all are in agreement that several factors must be in place for development to occur. Knight (1980) suggests that land availability, ease of land assembly, social and physical characteristics, economic conditions, community support, public land use policies must exist and an absence or weakness in any one of them can lead to lessened or no impact. Cervero (1987) goes further by specifying other prerequisites, including hospitable station area environments, unwavering political support, and the existence of pro-development zoning, taxation, and land use policies. More generally, Porter (1997, 1) argues that “transit-focused development generally occurs under three conditions: when stations are located in primate regional and community nodes of activity attractive to typical market forces; when the regional and local real estate market is active; and when public policies and regulations permit or encourage intensive development in station areas.” One area of agreement has been the notion that unsupportive local government policies (e.g., lot-size restrictions, single-use zoning, bulk restrictions) have been a key reason that development was stifled around several transit investments (Dingemans 1978; Pucher 1988; Bernick and Cervero 1997; Parsons Brinckerhoff Quade & Douglas, Inc. 1996; Porter 1997).

While some research focuses on sticks and carrots for development around transit, others researchers consider the need to dissuade market actors from pursuing alternative real estate investments in locations unserved by transit. For instance, a need for strict growth boundaries, disincentives for sprawl development, highway capacity constraints, automobile user fees, changes to public finance, and other measures are thought to be promoters of land use impacts around transit (Giuliano and Agarwal 2010; Boarnet and Crane 1998). Knight and Trygg (1977b) assert that part of Toronto’s densification around transit stations in the 1950’s can be attributed to restrictions on development outside of transit station areas.

An issue with this dialogue is that many of these factors are critical factors for development of any kind in any location, suggesting that development may be directed anywhere in a region with or without transit if these factors are present. Researchers have observed that local policy adjustments made to promote development around transit investments have enabled urban form changes even when transit projects are subsequently stalled or abandoned (Giuliano and Agarwal 2010).

“Experience indicates that major transit improvements often act as catalysts in the process of land use change, coalescing support for previously contentious policy changes. […] This indirect influence may in fact be one of rapid transit’s most powerful means of generating land use impacts” (Knight 1980, 10).

In this sense, transit acts as a Trojan horse for land use policy changes and allows market forces to deliver high-density development independent of transit’s role. One could describe transit investments as countervailing forces to the factors that economists suggest contribute to restrictive zoning policies (Fischel 1987; Fischel 2005). Based on the evidence reviewed for their macro overview, Knight and Trygg (1977a) concluded that claims of massive development and property tax benefits resultant from transit investments were unlikely and that the land use impact of transit, at best, was to help concentrate development by providing the rationale for supporting focused growth policies. Giuliano and Agarwal (2010) suggested that there were
more efficient means of accomplishing land use goals than the indirect influence that multi-
million dollar transit capital outlays have. For example, to address restrictive local zoning codes,
one could consider legislative actions that curtail some local prerogatives.

**Site-specific economics of supply**

The concerns about land use outcomes around transit put forward by Porter (1997, 11) were in
response to considerable attention paid to underperforming transit projects: “The location of
transit lines and stations is rarely determined with the potential market for development
opportunities near them in mind. This results in many stations occupying areas unattractive to
developers.” As Moore et al. (2007, 142) point out, “Land use for rail is first about getting the
stations in the right place.” In addition, the Government Accountability Office (2010) determined
that transit location, transit design, and market conditions all strongly influence value capture
outcomes. Assuming that transit stations should be located in advantageous locations for real
estate development if one goal of a transit investment is to be supported by nearby development,
the key is to define and identify advantageous locations.

Knight and Trygg’s research highlighted the need to conduct site-specific evaluations of real
estate development potential because many of the factors they identified that influenced
development were location specific. In recommendations for federal policymakers, they
suggested, “Impact-potential assessment for proposed transit improvements should include site-
specific evaluations of the effect of these factors, and such evaluations should include
knowledgeable real estate development perspectives” (Knight and Trygg 1977b, 6). A site-level
understanding of real estate development requires attention to both supply-side and demand-side
aspects of real estate project economics.

When contemplating the economic feasibility of pursuing any real estate development, not just
real estate development around transit, it is fundamental to appreciate that the production of real
estate typically does not correspond to the total population that cares to occupy real estate in a
given location. In most situations, some individuals will have a willingness to pay that is below
the price at which a good is supplied. Their demand for space will not be met by producers. The
same is true for housing, office, retail, and other types of real estate. Certainly, increased relative
accessibility might generate additional demand (higher prices) in transit served locations.
However, does transit access generate so much demand for locations that a real estate product’s
revenue stream exceeds the cost of construction, let alone the cost of construction, land, and
other costs combined?

In most cases, rational economic actors will not supply goods at prices below the cost of
production. Affordable housing programs, like the Federal Low Income Housing Tax Credit and
Section 8 housing vouchers, reflect this rationale. In the case of LIHTC, supply-side subsidies
compensate housing suppliers such that they are able to reduce the price at which they are able to
offer properties to consumers, a requirement of the subsidy, while still being compensated above
the cost of production. In the case of Section 8 housing vouchers, renters are given vouchers
which housing suppliers can take to the government to receive market-rate rents that cover the
cost of production.

For the most part, real estate production cost for a particular development is determined by the
cost of land, land preparation (e.g., demolition, remediation, permitting), capital costs (e.g., debt
service, investment returns), construction costs, and transaction costs. Utter (2009) suggests that
transit-oriented development projects are relatively high cost due to entitlements, design
complexity, parking integration, public amenities, community benefits, and the complexities of public-private partnerships.

While transit-oriented projects may be more costly than other projects, real estate production costs of any type of building or community vary by location. For example, some locations have natural features, like hills or high water tables, that make land preparation and construction more expensive. Other locations have environmental encumbrances that must be remediated at considerable cost before the land can be developed. A major variable across geography, owners of land may already be using it productively and any new development must compensate the owner for their foregone profits. Tearing down a two story apartment structure to build a three story apartment building may be infeasible because the new three story building could not provide a return to investors and compensate the owner of the two story building. It may also be the case that property owners make considerable profits from operating small stores, self-storage facilities, or even parking lots on properties that make it economically infeasible to compensate the owner for their foregone profits using the proceeds from the redevelopment of the property.

Even if development is economically viable at a price that covers the foregone profits of the landowner, under the U.S. legal system, private land rights are sacrosanct and landowners can choose not to sell or develop their property—electing to exercise or hold their development option. They might choose to wait for prices to rise, for public policies to allow even more development on their property, or may hold out for non-economic reasons. In fact, the ability to use eminent domain to take land from holdouts was a primary rationale for urban renewal and redevelopment agency policies. However, such takings have been strongly curtailed in the wake of the Supreme Court’s Kelo decision.

The cost of production of real estate also varies based on the type of product supplied. For instance, single story buildings can be constructed without load bearing walls. Therefore, they are less expensive than multistory buildings. As buildings get higher, building codes require more substantial structures such that building a six story building can be substantially more expensive per square foot than a four story building. Generally, the literature has treated costs as rising with density. For instance, a foundational paper on real options suggests, “The cost of constructing a building on a given piece of land…is an increasing and convex function of the number of units” based on the rationale that “as the number of floors in a building increases, labor costs per floor increase and the foundation of the building must be stronger” (Titman 1985, 506). Because the cost of production for taller buildings is so high, there are fewer consumers that can pay for the space. Thus, fewer of the more expensive buildings are supplied. If inexpensive buildings are prohibited by public policies, then no building may be feasibly and legally supplied.

The cost of real estate development is also influenced by public policies, particularly those that require lengthy approvals or specify particular design elements. Delays in the project permitting process can contribute to more loan interest payments, greater tax burdens, inflation risk, and more overhead, potentially dampening supply in markets impacted by regulation (Quigley and Rosenthal 2005). Some public policies explicitly relate to project costs, including architectural design guidelines, and can impact the feasibility of development. Research on the financial feasibility of Smart Growth and New Urbanist developments suggest that they exhibit higher average costs when compared to conventional developments due to design elements, higher levels of public participation, higher regulatory costs, and higher financing costs (Song and Stevens 2011). To combat the higher costs and make such developments more feasible,
researchers recommended that developers of New Urbanist projects revisit their approach to public involvement, focusing involvement on factors that do not add costs and limiting input opportunities. Furthermore, research has found that Smart Growth land use planners often promote policies and plans undergirded by faulty real estate feasibility assumptions—for instance, assuming that dense nearby residential development will be adequate to support neighborhood retail or assuming that denser development is invariably more feasible than less dense development—that therefore fail to effectively promote land use impacts (Boarnet et al. 2011; Levine 2006; Bartlett 2003; Nelson and Niles 1999; Porter 1997).

In addition, the scale of a real estate project can impact capital costs and exposure to inflation, construction, and other risks. When real estate investors consider their return, they do so by contemplating time-adjusted costs and revenues. Their investments in land and construction are made early in the development process and can only be recouped once the real estate is purchased or leased. The speed at which real estate is purchased or leased impacts the attractiveness of the investment. All else equal, projects that are very large and take long periods to construct and lease or sell may have a lower present value than small investments that take only a short time to generate returns.

When one compares 200 units of housing built as single family units over the course of two years to a 200 unit apartment building also built over two years, the principle is illustrated clearly. Investors may only need to provide enough money to build the first 20 single family housing units. Once built and sold, the money invested in the first houses can be recycled into the construction of the next group of houses and returns can be paid to the investors. However, an apartment building commits an investor to constructing 200 housing units that can only generate revenue and investment returns once the entire building is completed. The required investment may be considerably more than the single family investment and the returns are achieved over a much longer period. Additionally, if the market changes over the course of either project, the single family project is more adaptable.

Given these factors of supply-side real estate development economics, it is clear why Knight and Trygg (1977b)suggested that the existence of strong demand for new space and the availability of land were necessary for development to be feasible around transit investments. While development may be more likely where there is “strong” demand rather than “weak” demand, strong overall demand does not guarantee that demand for any given project will be great enough for the development to be feasible. In particular, the coarse concept of market strength ignores the existence of both geographic and product-specific differences in demand.

An individual’s demand varies by property based on his preferences for property characteristics. For example, demand for high-density housing—that most discussed when considering transit-supportive development—may be lower than low-density housing in the same market. Empirical research has found that transit served developments achieve price premiums (see sections above), though it is not clear that premiums are consistent across populations or significant enough to justify real estate development in many locations. Additionally, studies of New Urbanist and Smart Growth communities suggest that they too achieve some premium over conventional development, though not necessarily enough to overcome the higher costs associated with that form of development (Song and Stevens 2011).

Additionally, demand can vary from one side of the street to the other, due to school district boundaries as an example. Thus, considering demand as monolithic for a station area, an entire
transit investment that stretches many miles, or a region, is inadequate. Just as supply-side costs vary by location and project type, so does demand.

Even in strong regional markets there are sub-markets where demand is too weak for any development to be feasible. In other locations, only modest amounts of development can be supported by local demand. This has implications on the effectiveness of land use regulations.

As argued by Levine (2006), land use controls often place upper bounds on the scope of development whereas the actual density of new development is dictated by the complex interactions of supply and demand on a given site. At times, developments substantially greater than the restrictions are feasible and zoning acts as the binding constraint on what is built. In other instances, feasible development is of a size and scope that is significantly below the restrictive bounds. Thus, allowing more development, either through upzoning or density bonuses, may have little impact on the feasibility of development where land use restrictions are not the binding constraint. In fact, Pendall (1994) found that regulations that enabled greater land use density were an insufficient factor in promoting new development in the 1,200 jurisdictions he surveyed. Therefore, any influence that transit may have on the political will to increase zoning allowances around transit stations may have no impact on the feasibility of development in a station area where the land use controls are not the binding constraint.

In fact, raising the zoning thresholds may provide owners with more valuable options and increase their motivation to “hold out” from developing or selling to developers, undermining otherwise economically viable development projects. Real-options analysis has considered aspects of the development process as a securities option since Brennan and Swartz (1985) and Titman (1985) adapted the financial securities work of Merton (1973) and Black and Scholes (1973) to real estate. The work of Titman (1985) suggested that in markets where development was feasible, lowering zoning constraints might be a way to hasten development and overcome the tendency of landowners to preserve the development option bestowed upon them by regulatory bodies. Several other researchers have approached the problem from other angles. “Despite the difference in the Williams–Titman–Turnbull approaches, they all yield the same conclusions for binding density restrictions (which hasten expected development time) as long as the density restrictions are not set too low relative to the market solution” (Jou and Lee 2007, 232).

Further, real estate development often displays diminishing marginal returns per unit of development because of scale impacts on revenue streams. Returns are impacted by cannibalization—or overbuilding—and net present value deterioration as absorption timelines extend with project size. When a project is estimated to be larger than what would be optimally profitable on a site given both supply and demand, it is considered overbuilt. Speculative overbuilding has long been a theme in the literature, an example of which is Homer Hoyt’s (1933) assessment of real estate cycles using Chicago land values. More recent literature on the optimal height of skyscrapers found overbuilding to be a consistent fact of the practice (Barr 2010), one attributable to competition between major development outfits (Helsley and Strange 2008).

The panoply of factors that contribute to development feasibility must be aligned for unsubsidized development to occur, particularly denser and larger urban infill projects. Many of these factors are influenced by outside parties, not least of which is the transit agency that
determines where stations are located and, therefore, where transit-served development can take place. Knight and Trygg’s research highlighted this fact:

“The study’s findings indicate that [no factor] can be ignored, for a serious deficiency in any one appears to be capable of limiting or even preventing land use impact. Thus to achieve desired land use impacts, all the factors should be made as favorable as possible. In some cases this may involve moving a proposed transit station to a more advantageous location; in others there may be a need to coordinate policies in land use, taxation, urban renewal, and infrastructure with the transit investment.” (1977b, 205)

Given the realities of transit’s accessibility improvements in our automobile dominated U.S. landscape, research on the conditions that are supportive of development suggest that it may be most efficient to align transit with sites that are ripe for real estate development irrespective of a transit investment.

Implications for the impacts of transit investments on real estate development

Urban economic theory certainly suggests that transit can have a direct impact on land use and urban development in specific circumstances, particularly when it provides significant accessibility benefits. Empirical work on land value impacts of transit investments has demonstrated that some investments have generated incremental land value or rents around stations while other investments have not. However, even when positive land value impacts occur, it unclear at what point they reflect substantial enough changes to trigger real estate development.

Case study research has determined that even if transit confers significant accessibility gains, a panoply of critical factors (e.g., local government policies; real estate markets; availability of land) must be present for transit to have an impact on urban development. In fact, researchers observe that the alignment of these numerous factors might require that transit planners adjust transit plans such that transit stations are “coordinated” with advantageous locations for real estate development, places where local land use policies and other potential impediments have been addressed. “Without coordination, urban development will continue to be essentially unplanned and the land use impacts sought from transit improvements will seldom be realized. This is the central fact of the experience reviewed in this study” (Knight and Trygg 1977b, 211).

The models and empirical work suggest that transit will have little impact on relative accessibility in most instances and will therefore have modest influence on real estate development. As Cervero and Landis (1995, 10) explained in a seminal work of the transportation-land use canon, “We must keep in mind that evaluations of how land use environments affect travel demand are being made in a distorted marketplace of cheap automobile travel, where motorists don’t pay for externalities. It is no surprise that transportation-land use outcomes have been suboptimal in a world of suboptimal pricing. This we argue, is not an indictment of the land use-transportation connection, but rather an indictment of current policies for pricing and managing our transportation and land use resources.”

However, as suggested by Knight and Trygg (1977b), transit investments have spurred land use policy changes that have allowed development to occur in locations where it was likely to occur even without transit access had those impediments been otherwise addressed. On the other hand, land use policy changes were unlikely to have an effect in places where project level economics suggest that development was otherwise infeasible. Again, in the words of Cervero and Landis
(1995, 8) describing the impacts of BART, “Outside downtown San Francisco, job growth and land use changes around BART stations have been uneven. Where little new growth has occurred, the chief reasons have been either downzoning and NIMBY resistance (for example, at the Rockridge and North Berkeley stations) or weak local real estate markets (for example, at the Richmond and Fruitvale stations).”

Ultimately, two findings from Knight and Trygg’s research resonate loudest when contemplating the impact of transit investments on real estate development. For real estate development to occur around modern U.S. transit investments, stations must be aligned with locations where development was already likely to occur or locations where the construction of stations is an inducement of sufficient political will to address the inhibitors of real estate development that previously existed in that location. And, any meaningful assessment of real estate development potential must be undertaken at a “site-specific” development project scale because of all the economic factors that determine the feasibility of development, which can be significantly different on two neighboring parcels for a host of context-specific reasons.

**Gap in the practice literature**

As discussed above, the literature on integrated transit and land use planning suggests that transit planners play a significant role in determining the potential for real estate development around transit stations. However, to date, research on planning practitioners and their practices has not focused on this aspect of transportation planning practice. What has been written has considered transit planners appreciation of ridership and cost forecasts, particularly in relation to federal grant programs (Wachs 1989; Wachs 1990), or considered self-reflections on the roles of urban transportation planners (Forester and Kreiswirth 1993). This study is the first to investigate the practice of integrated transit and land use planning from the vantage point of transit planners.
Section A-2: Research design

This research sought to understand how real estate development considerations were part of transit planning processes and might impact project designs. My research design allowed me to generate a rich understanding of transit planning practices informed by the potential for real estate development around proposed transit stations. For this study, I conducted unstructured and structured interviews with practitioners; reviewed planning and policy documents; and participated in meetings with transit planners and FTA officials. I then interpreted the data collected from these approaches in a rigorous qualitative analysis fashion using coded categorization and case study preparation. This chapter describes my theoretical approach, data collection methods, and data analysis methods in greater detail.

Theoretical approach

Though always focused on the transit planning practice, this investigation’s theoretical approach evolved to focus on two sub-units of analysis embedded in two theoretical understandings of professional practice. Part B of the dissertation focuses on transit planning actions and rests on the technical-rational model of practice. Part C of the dissertation focuses on theories-of-practice and rests on interpretive theories.

Long interested in the topics of transit value capture and federal transit policy, I initially set out to understand the intersection of the two through this dissertation research. How might U.S. federal transit grant programs—which fund the majority of major transit construction projects in the United States and evaluate funding requests based in part on the real estate development potential around proposed projects—promote real estate development-oriented transit planning? Extrapolating from the literature on international transit planning, I hypothesized that transit planners in the United States were consciously selecting routes and locating stations in places where they thought that real estate development was likely to occur and where real estate value could be accrued to the transit providers—a concept known as value capture. In addition, I hypothesized that evaluation guidelines for the Federal Transit Administration’s New Starts Capital Grants program perpetuated such practices because prior research had found that transit planning practice had been marginally impacted by the real estate development-related criteria, including reprioritizing the backlog of transit investments in regions and justifying the adoption of several regional policies that addressed integrated transit and land use planning (Deakin et al. 2002; Deakin, Payne, and Menotti 2004).2

Because the research questions were exploratory in nature, they required a qualitative research protocol that involved interviewing transit professionals about their practices. In the early stages of the research, I focused on transit project planning by applying a theoretical vantage point in which professional planners acted as technicians leading prescribed processes originating in design ideas and culminating in built transit projects. This reflected the notion of practice as individual, technically-driven behavior seen in terms of performances, events, and effects (Kemmis 2009). Using this “technical-rational” model of practice (Schon 1990), I approached the planning of transit projects funded through the Federal Transit Administration’s New Starts program, a policy that federal policymakers explained had been developed based on scholarly research regarding transit and land use coordination. I identified various adaptations planners had

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2 See Appendix A for a discussion of the New Starts policies.
made to transit planning processes and project designs in light of real estate development considerations, particularly those considerations prompted by the New Starts policies.

However, the findings from my early interviews with transit professionals and New Starts policymakers revealed that many practitioners were acting outside of the governing bounds of the New Starts policy when they described their practices. I understood that something larger was at play as they explained how and why they realigned transit projects’ routes or moved stations in an effort to promote real estate development around the projects that they had planned. Interviewees suggested that real estate development around transit was a major consideration of their practice and the federal policies played a role in very few of their actions.

Initially, I found that the evidence suggested that planners were basing their practice on their experiences in the field rather than the New Starts policies. For example, they mentioned specific instances of real estate development around transit projects that had inspired them to pursue real estate development around the projects they planned. This matched the notion of “professional artistry” and “reflective practice” in which practitioners are not guided by “the book”, but by a set of practice theories that are applied in practice, reflected upon, and repeated (Schon 1983; Higgs, McAllister, and Whiteford 2009). I began to ask more questions about the replicability of prior experiences and why they thought that certain outcomes would occur on the project they had planned.

As I refocused my attention away from the outcomes of planning practice and toward the theories that planners employed when predicting the potential for real estate development around proposed transit stations, I realized that transit planning professionals, including New Starts policymakers, were acting based on some common notions and with common purpose. They explained the intents and justifications of their actions in terminology that reappeared across many of my interviews. I found that professionals were universally promoting Smart Growth urban development through transit interventions and that they believed that transit was an important catalytic precursor for such land use changes. The pattern suggested that transit professionals were part of a practice community (Eraut 1994), not just acting according to their own internal reflective practice or according to external federal policies. This reflected the interpretive notion of practice as norms shaped by discourses and traditions (Kemmis 2009). On its own, my technical-rational investigation of specific planning processes and resultant transit project outcomes failed to appreciate the theories of practice that planners were employing as they worked. Therefore, I adopted an interpretive lens on practice to carry out the remainder of my data collection and analysis.

The interpretivist methods I used were based upon the premise that understanding how practitioners explain their practices and the work of their profession is the first step toward interrogating their tacit theories-of-practice, which theorists like Donald Schon suggest guide professionals’ actions in the field (Argyris and Schon 1974; Schon 1983; Yanow 2000; Kemmis 2009). In this vein, Part C of this dissertation focuses on interpreting and categorizing the breadth of planning motivations and theories of planning practice that transit planners, New Starts policymakers, and New Starts policy implementers espoused as they explained the practice of planning transit projects to affect urban development.

While Schon’s theories have been the basis for significant literature in the education field and inspired the work of other urban planning theorists like John Forester, no research has used this
theory to evaluate transportation planning or its integration with real estate development.\(^3\) Related planning research is limited to the one-on-one interactions of local land use planners with real estate developers (Schon 1983; Forester 1987; Krumholz and Forester 1990; Forester and Kreiswirth 1993; Forester 1999), and Wachs (1989; 1990) did not use a formal theory of practice to inform his work. This research is the first to consider integrated transportation and land use practice using this particular theoretical lens.

**Data collection**

For both theoretical approaches of this investigation (technical and outcome focused; interpretive and meaning focused), I developed my understanding of integrated transit and land use planning by immersing myself in the field of U.S. transit and land use planning, similarly to Flyvbjerg’s (2001) description of phronetic social science\(^4\) and in the manner that Yanow (2000) defines for interpretive policy analysis.\(^5\) That immersion included becoming very familiar with the federal New Starts program that funds most major transit investments in the United States.\(^6\) While heavily reliant on first-hand interview evidence, the approaches rely on triangulating from multiple data sources to describe how society has functioned and hypothesize how it might function more broadly.

I gathered primary and secondary data from the following sources: (a) unstructured exploratory interviews, semi-structured individual interviews, and semi-structured group interviews with transit planners (transit agency planners, regional agency planners, and their contractors), transit policymakers, federal bureaucrats, and federal consultants; (b) publicly available planning, policy, and organizational records; and (c) participant observations of meetings that were relevant to integrated transit and land use planning and the New Starts program.

Each data collection method is discussed in the following sections.

**Interviews**

My analyses relied heavily on interview data from individual or group conversations with 137 practitioners. Ultimately, 98 interviewees provided insights pertinent to their transit planning experience as a transit planner, New Starts policymaker, or New Starts policy implementer. I collected personal characteristics in a systematic fashion using semi-structured interviewing

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\(^3\) This research rests heavily on the theories of Donald Schon. As an MIT professor of City Planning, he developed a robust theory of professional practice that has been the basis for subsequent theories of practice. “An important element in the history of reflective practice is the fact that its theory was introduced in the field of city planning—and indeed, in many other professional fields—in large measure by one person, Donald A Schon” (Fischler 2012, 315).

\(^4\) Rather than a particular methodology, phronetic social science calls for an engaged approach to understanding dynamic social life through a triangulation of multiple data sources and diverse analytical techniques that reveal how people act with intent (Flyvbjerg, Landman, and Schram 2012). “Phronetic social science emphasizes that social sciences can provide an important research supplement to the kind of knowledge that comes from an intimate familiarity with practice in contextualized settings. This is research in aid of local knowledges, even tacit knowledges, that cannot be taught a priori but which grow from the bottom up, emerging out of practice.” (Schram 2012, 19)

\(^5\) Interpretive policy analysis leverages any broad set of data gathering and analytical methods that researchers see fit to help them triangulate an understanding of the varied meanings assigned to policies by groups that regularly interact with a policy issue and a particular policy’s implementation (Yanow 2000).

\(^6\) See Appendix A for a discussion of the New Starts program and relevant policies.
methods (Rubin 1995). Per the table below, interviewees were predominantly male and between the ages of 40 and 60 years old.

**Table 1 - Number of interviewees by gender**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Interviewees that contributed relevant data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>73</td>
</tr>
<tr>
<td>Female</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
</tr>
</tbody>
</table>

**Table 2 - Number of interviewees by age**

<table>
<thead>
<tr>
<th>Age</th>
<th>Interviewees that contributed relevant data</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-40 years old</td>
<td>18</td>
</tr>
<tr>
<td>40-60 years old</td>
<td>63</td>
</tr>
<tr>
<td>60+ years old</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
</tr>
</tbody>
</table>

To begin each interview, I asked individuals to describe the arc of their careers and how they came to be involved in transit project planning. Interviewees included professionals with experience as FTA staff, transit project planners, transit system planners, land use planners, economic development professionals, and other transit consultants. In many instances, a single interviewee had served in more than one of those roles during their careers and their input was informed by multiple vantage points. Whenever possible, I asked interviewees to clarify what their role was when they had certain experiences or developed certain opinions that arose during our conversations. To better understand how interests might vary across groups of stakeholders, I questioned my interviewees about how their views had changed over time and across their various roles. The tables below provide a glimpse of the diversity of the interviewees involved in the study.

**Table 3: Number of interviewees by professional experience in various types of organizations**

<table>
<thead>
<tr>
<th>Organizational affiliations</th>
<th>Interviewees that contributed relevant data</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Department of Transportation (including FTA)</td>
<td>10</td>
</tr>
<tr>
<td>State Department of Transportation</td>
<td>8</td>
</tr>
<tr>
<td>Regional government</td>
<td>12</td>
</tr>
<tr>
<td>Transit agency</td>
<td>62</td>
</tr>
<tr>
<td>Local government</td>
<td>15</td>
</tr>
<tr>
<td>Consultancy</td>
<td>25</td>
</tr>
<tr>
<td>Private Real Estate</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
</tr>
</tbody>
</table>
Table 4: Number of interviewees by type of experience

<table>
<thead>
<tr>
<th>Professional experience</th>
<th>Interviewees that contributed relevant data</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Starts policymaking and implementation</td>
<td>15</td>
</tr>
<tr>
<td>Transit system planning</td>
<td>54</td>
</tr>
<tr>
<td>Transit project planning</td>
<td>64</td>
</tr>
<tr>
<td>Travel demand modeling</td>
<td>4</td>
</tr>
<tr>
<td>Non-transit transport planning</td>
<td>2</td>
</tr>
<tr>
<td>Transportation and land use advocacy</td>
<td>3</td>
</tr>
<tr>
<td>Land use planning</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98</strong></td>
</tr>
</tbody>
</table>

Of those 98 interviewees, 63 transit planners contributed data relevant to transit project impacts across 19 regions (see table below) and 96 practitioners—transit planners, policymakers, and policy implementers—contributed data relevant to the theories-of-practice.

Table 5: Number of interviewees who discussed real estate development-inspired adaptations to transit planning processes and project designs

<table>
<thead>
<tr>
<th>U.S. region where transit planning process or project design was impacted</th>
<th>Interviewees that described the impacts and the impetus for those impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta</td>
<td>2</td>
</tr>
<tr>
<td>Austin</td>
<td>2</td>
</tr>
<tr>
<td>Boston</td>
<td>4</td>
</tr>
<tr>
<td>Charlotte</td>
<td>8</td>
</tr>
<tr>
<td>Chicago</td>
<td>2</td>
</tr>
<tr>
<td>Dallas</td>
<td>10</td>
</tr>
<tr>
<td>Denver</td>
<td>1</td>
</tr>
<tr>
<td>Eugene</td>
<td>3</td>
</tr>
<tr>
<td>Fresno</td>
<td>2</td>
</tr>
<tr>
<td>Honolulu</td>
<td>3</td>
</tr>
<tr>
<td>Houston</td>
<td>1</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>9</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>5</td>
</tr>
<tr>
<td>Phoenix</td>
<td>2</td>
</tr>
<tr>
<td>Portland</td>
<td>14</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>5</td>
</tr>
<tr>
<td>San Diego</td>
<td>4</td>
</tr>
<tr>
<td>Seattle</td>
<td>1</td>
</tr>
<tr>
<td>Washington DC</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>63</strong></td>
</tr>
</tbody>
</table>

**Sampling method**

I based the insights in this dissertation on a relatively large sample of interviews. The evidence was gathered with a focus on categorizing and describing transit planning practices. As the investigation proceeded, I aimed to illuminate the breadth of theories held by practitioners who had been influential in planning major transit investments. I identified prospective interviewees using multiple methods, but primarily in a combined “extreme” and “snowball” fashion that was
intended to identify participants who could provide rich evidence rather than to yield a representative sample. Federal staff and key FTA consultants were identified from staff directories, archival documents, and by other interviewees during our conversations. They pointed me to New Starts-funded transit projects that had been strongly influenced by real estate development considerations—the “extreme” cases. I identified the relevant transit project planners from archival documents. In most cases, project documents recorded the transit agency staff involved in project planning and interviews with those individuals led to interviews with the transit project consultants they identified during our conversations.

Other interviewees were identified via presentations at professional conferences (see discussion of participant observation methods below). When a transit planner presented about a transit project that had been influenced by real estate development, I inquired with them after the presentation about the critical stakeholders on the project so that I might interview them. The presenters were sometimes key stakeholders themselves or provided warm introductions to potential interviewees.

Finally, a small set of interviewees were identified through less intentional “snowball” fashion, with initial interviewees introducing me to colleagues and acquaintances or past clients that had planning experiences pertinent to the topics we discussed. While it was not feasible—or my intention—to obtain a representative sample for this qualitative research, I purposefully continued to pursue interviews until I considered my sample to include a diverse set of interviewees across a wide geography that could shed light on transit planning practices from multiple viewpoints.

To carry out interviews, I either asked subjects for an interview in person or emailed them a request for an interview. Though I had to make some requests multiple times, I eventually achieved over an 80% response rate to my requests for interviews.

The number of interviews conducted for this analysis was determined by my analysis of the data that I gathered. I analyzed interview transcripts as soon as possible after conducting interviews and determined whether my data had reached a point of saturation (see discussion of saturation in the interpretive analysis section below).

Interview format

I conducted interviews in two distinct phases. Initially, the interviews were exploratory in nature and were relatively unstructured. Per Rubin (1995), I reviewed a list of nested research questions before conducting each of the exploratory interviews but allowed the conversations to meander based on the interests of the interviewee. During the initial exploratory interviews, I sought to understand the facts of the New Starts policy, its implementation, and its impact on transit project planning and design. Per Small’s (2009) methodological framework of iterative and progressively refined interviewing, I also sought to identify broad themes during the exploratory phase that then informed subsequent interviews.

During the exploratory interviews, I also sought feedback on my initial case study selections. As further discussed below, my list of case studies changed over time as interview subjects explained how certain themes that I was exploring were more or less present in various project planning processes.

It became clear after relatively few interviews that the New Starts policies were not the governing factor in transit planners’ practices. Interviewees consistently espoused theories about
transit investments’ impacts on real estate development that were not part of the New Starts policies, and frequently described their actions separate from the New Starts policy. Planners explained that they made real estate development-related adaptations to transit plans in support of Smart Growth urban development. Upon reaching this saturation point across the exploratory interviews (M. L. Small 2009; Yin 2009), I switched course and began to conduct more structured interviews. (I continued to ask questions about New Starts of all interviewees but was able to refine my New Starts-related questions and focus time on other themes.)

During the semi-structured interviews, I focused the conversations on particular themes and, if the interviewee was appropriately positioned, on the details of case study planning processes. Though not every interview was conducted identically, I generally began by asking interviewees about their background and how they came to be involved in planning a New Starts project. I then asked about the transit projects they had worked on and if they had considered real estate development as they carried out the planning process. When they discussed the influence of real estate development, I asked for clarity on how it had impacted the project, what and who had motivated the impact, and whether the New Starts policy had been a factor.

Figure 1 – Sample interview guide for a semi-structured interviews early in the process
(Interview guide changed from week to week.)

- Background
  - Education
  - Experience by org type, project planning roles, years
  - Experience in real estate development
- Planning projects
  - What types of land use impacts do you expect around projects?
  - Have projects been tailored to promote that real estate development?
  - What was your involvement in changing transit project plans?
  - How did you think the change would affect real estate?
- New Starts
  - How does NS play a role in your practice?
  - How did you become familiar with the Economic Development criterion?
  - Has it played a role in any of the projects?
  - If local land use planning, what does good land use planning entail?

Interviewees would often lean on certain theories about the impacts of transit investments on real estate development as they described their practices. I would ask for greater clarity on the concepts and their applicability as they arose during the conversation or make a note to return to the topic when we reached a break in the flow of conversation. The themes of theories-of-practice and causal pathways became a primary focus of the latter half of my interviews.

To understand practitioners’ theories, I would begin by asking interviewees questions about land use impacts they had seen around transit facilities they had planned. Depending on the flow of conversation, I then asked practitioners how they understood the transit investments planned by them and fellow transit planners influenced real estate development in station areas. I often asked for clarification about causal mechanisms if I had not yet heard about them in prior interviews. When appropriate, I also asked interviewees how they determined the potential for real estate development around projects. As I had done before, I conducted semi-structured interviews until reaching a saturation point where I heard familiar responses over the course of several sequential
I also carried out a set of brief follow-up interviews that were highly structured and focused. For example, I contacted several interviewees to understand the specifics of a particular transit project design element that another interviewee suggested may have been influenced by real estate development. In other cases, I contacted an interviewee for a second conversation to reconcile inconsistent evidence from other interviews.

I recorded in-person interviews using a digital recorder. I recorded phone interviews by conducting them via a conference call line that offered a recording feature and produced a digital recording. While I had anticipated these interviews lasting 30 minutes, most interviewees opted to continue our discussions for an hour or more, with the longest lasting 95 minutes. I spoke with several interviewees on as many as three occasions, including initial interviews and follow-ups, and conducted one formal interview over the course of two phone calls that lasted more than two hours total. All audio recordings of the interviews were transcribed into digital text documents.

Document review

While this research relied heavily on interviews, I also incorporated a review of historical New Starts policy documents, current New Starts statutes and guidance, and historical planning documents relevant to the project case studies. Archival evidence was critical to the development of historical case studies and my review of policy documents was critical for interpreting theories-of-practice. Adopting an interpretive approach to practice informed my treatment of policy documents as evidence of policymakers’ espoused theories and as a reflection of broader discourse on transit planning practice (Yanow 2000).
To understand the New Starts policies, I initially reviewed policy documents made available by FTA on their website. Likewise, to gain an initial understanding of case study transit projects, I reviewed the limited documentation that was available on the websites of relevant transit agencies and regional agencies. Interviewees also frequently pointed me to related documents that could be found on the internet. In some instances, only physical copies of historical documents were available. Interviewees often shared those documents with me temporarily so that I could make digital scans before returning them. In addition, I visited the archives at FTA’s offices in Washington D.C. to review the materials that FTA retained on specific transit projects, particularly environmental documents from multiple phases of project planning.

Interviewees pointed me to several New Starts policy documents. After learning about their origins, I decided to use many of them as evidence of theories regarding the impacts of transit investment on real estate development. As explained by several New Starts policymakers, the policies reflected state of the art transit planning practice at the time of their drafting in the early 1990’s. In subsequent years, FTA set out to revise and update the policy language. In a handful of instances, factors were added to the real estate development-related policy. In all cases, the FTA took public comments and responded to them in the federal government’s public record.

In addition, FTA worked with its staff of contractors to develop policy implementation guidelines. FTA staff explained that the guidelines were developed in the early 2000’s in response to stakeholder concerns that the subjective evaluations were inconsistent. Consultants and FTA staff collaborated for many months to determine the best practices in transit and land use coordination, data sources, and evaluation scoring thresholds that would be employed by all parties. I reviewed an older and a newer version of the document during my analysis.

Ultimately, I referred to the following policy documents when developing the taxonomy of theories described in Part C of this dissertation.

- “Revised Measures for Assessing Major Investments: A Discussion Paper” (Federal Transit Administration 1994b)
- “Guidelines and Standards for Assessing Transit-Supportive Land Use” (Federal Transit Administration Office of Planning 2004)
- “Major Capital Investment Projects” (Federal Transit Administration 2013a)
- “New and Small Starts Evaluation and Rating Process - Final Policy Guidance” (Federal Transit Administration 2013b)

**Participant observation**

This research also relied on data collected during my participation in meetings relevant to policymaking, policy implementation, and transit project planning best practices. To improve the credibility of my work, I sought to have close interactions with the phenomena that I was studying and the realms in which policymaking and other forms of knowledge transfer took place (Becker 1996).

Between January 2012 and November 2013, I participated in 10 conferences of four membership organizations that host sessions focused on the land use impacts of transit (I am a subcommittee
member of two of the organizations and I also participated as a speaker at some of the conferences. I also was an observer at two FTA-sponsored public meetings discussing proposed New Starts rulemaking that included a reconsideration of the existing real estate development-related policy elements. In ten of twelve instances, I attended the meetings in person. The meetings served as opportunities to better understand practice communities and practice norms, identify themes to explore, develop and test specific interview questions, meet potential interviewees, and confirm or modify interpretations of evidence that I had gathered in interviews.

Table 6 – Instances of participant observation

<table>
<thead>
<tr>
<th>Date</th>
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<tr>
<td>January 2012</td>
<td>TRB</td>
<td>Annual meeting; Transportation and Land Development Committee</td>
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<td>February 2012</td>
<td>FTA</td>
<td>NPRM Listening Session</td>
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<td>February 2012</td>
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<td>NPRM Webinar (participated over the internet)</td>
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<td>May 2012</td>
<td>ULI</td>
<td>Spring meeting; Transit-Oriented Development Council</td>
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<td>June 2012</td>
<td>APTA</td>
<td>Rail Conference; Land Use and Economic Development Subcommittee &amp; Major Capital Investment Planning Subcommittee</td>
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<td>October 2012</td>
<td>RailVolution</td>
<td>Annual Conference; New Starts Symposium (FTA listening session)</td>
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When appropriate, I digitally recorded audio during the meetings. In other instances, I took careful written notes because it was not possible to make an audible digital recording. All audio and written notes were transcribed into Microsoft Word documents for analysis.

My participation in these meetings informed the interview questions, and introductions made during the meetings led to several interviews. However, I do not rely directly on evidence gathered at these meetings in the chapters of this dissertation.

**Data analysis**

To interpret my observations of professional practice, I triangulated from multiple methodological vantage points. First, I used a multiple case study approach with two different units of analysis. Because case studies reveal in-depth and contextual understanding of social processes to probe the meaning and purpose for those involved (Yin 2009), I wrote historical case studies about the planning of three transit projects (see Part B) and interpretive case studies about several individuals’ espoused theories (discussed in Part C). Second, I utilized qualitative analysis techniques and NVivo software to analyze and categorize the contents of my collected evidence (discussed in both Parts B and C). Finally, similarly to prior literature on knowledge
claims (Næss et al. 2013), I privileged the academic theories identified in a review of the literature (see Section A-1) when I chose to compare them to interviewees’ theories and theories written in federal policy documents (see Part C). I discuss each of these analysis techniques in greater detail below.

Transit project case study analysis

As part of this investigation into the impacts of the real estate development considerations on transit planning processes and project designs, I wrote case studies about the planning of three completed transit projects. To develop case study narratives, I relied primarily on interviews with transit agency staff and transport consultants. Those interviews were informed and supplemented by reviews of relevant documentation like project alternative assessments, environmental review documents, New Starts project before and after studies, land use planning reports, and redevelopment agency reports. In many instances, the comparison of similar documents over multiple iterations offered the most revealing evidence of planning decision making. Interviews with key stakeholders about those changes often provided the clearest evidence of the influence—or lack of influence as it were—of the real estate development-related New Starts policy on project plans.

My case study selection process was phased and multi-criteria-based. Because the case study selection process started in the early phases of the research, the selection focused heavily on the role of the New Starts real estate development criteria in transit project planning. I initially screened cases based on whether projects had been evaluated according to the real estate development-related criteria, and then created a long list of potential case study projects from a review of readily available New Starts project documentation (e.g., New Starts funding agreements for ’00-’07). Using the broader set of criteria described in the table below, I narrowed the list to six projects.

Table 7 – Case Study Selection Criteria

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| Policy application | • Projects applied for and received New Starts funding  
                  | • Projects were planned when real estate development-related New Starts policies were enforced (current criteria where implemented in 1998) |
| Compelling narrative | • Case narrative exemplifies themes that emerged from exploratory interviews |
| Completeness     | • Projects had been planned to a substantial level such that station locations had been selected  
                  | • Projects were along new transit right of ways such that routes and station infrastructure were debatable |
| Location         | • Diverse cities  
                  | • Preference for fast-growing sunbelt cities that would be more representative of future transit investment locations and where slow regional growth could reduce the consideration of real estate development impacts |
| Typology         | • Projects that serve similar route structures (e.g., radial CBD-oriented) |
| Technology       | • Projects that represent future transit investments (e.g., Light Rail Transit) |
| Project scale    | • Project represents a major investment (New Starts rather than Small Starts) such that project size could not be a reasonable explanation for any lack of land use impacts |
| Data Availability | • Select projects for which interviews are feasible and New Starts documentation is available |
The following list describes the projects that I initially considered investigating and vetted during exploratory interviews:

- Dallas, DART Northwest/Southwest
- Los Angeles, Metro Gold Line Extension
- San Diego, Mission Valley East LRT Extension
- Denver, RTD Southeast LRT corridor
- Portland, Interstate MAX extension
- Salt Lake City, Medical Center LRT Extension

I modified and narrowed the list of case studies after recurring themes were identified in exploratory interviews, particularly when interviewees provided insights on the applicability of cases to my research topic. The case selection was also informed by a desire to identify extreme cases. Ultimately, I finalized the selection of three cases because interviewees knew of specific instances where the projects’ designs had been modified to promote real estate development. For example, Charlotte’s South Corridor was not on my initial list of projects but was added after numerous interviewees suggested it was the preeminent example of a New Starts investment informed by integrated transit and land use practices and that they knew of several stations that were explicitly included in transit plans to impact real estate development.

I selected the Interstate MAX case in Portland, Oregon for three reasons. My exploratory interviews revealed that this project’s planning process and design had been strongly influenced by real estate development considerations. Also, the precursor to this downsized investment, the South/North Corridor, had been a pilot application of the real estate development-related New Starts policies and, as described in interviews, was one of the piloted projects treated as a benchmark for other transit applicants. Last, I was interested to study a project in Portland because the region has long been considered a Smart Growth planning paragon since the 1970s, before the term Smart Growth actually existed.

In contrast to Portland’s Smart Growth mantle, I also selected a case in Dallas, Texas, a city synonymous with the car-centric American lifestyle. As one FTA staff person stated, the purpose of the New Starts policy’s focus on real estate development was to get “places like Dallas” to pay more attention to real estate development because they were such auto-oriented cities. Interviewees explained in some of my earliest interviews that the North Central Line had been planned by DART, a transit organization formed with a focus on commute congestion mitigation, and the project had been typecast as a park-and-ride commuter option from its inception. In spite of this, several interviewees pointed to instances when North Central stations were modified based on real estate development considerations.

As noted above, I also selected Charlotte, North Carolina’s starter line. Several FTA staff people and two FTA land use consultants noted that the Charlotte South Corridor was a project that had scored well on the real estate development-related elements of the New Starts evaluations and was perhaps the best example of transit and land use coordination they had seen implemented since ISTEA was passed in the early 1990’s.

The case study write-ups were written as historical narratives in chronological order. Triangulating from numerous data sources to produce coherent descriptions of transit project planning, each case study’s story provided evidence that contributed to the conclusions of this dissertation.
Practitioner case study analysis

After realizing that practitioners were frequently modifying transit project designs based on real estate development considerations irrespective of the New Starts policy but with a broader goal of promoting Smart Growth urban development, I began to more carefully consider the theories that had been espoused by interviewees regarding the impact of transit investments on real estate development. Because I adapted my semi-structured interviews in response to this finding, later interviews provided richer material for understanding the diversity of individuals’ theories.

I developed the case studies as a means of understanding the rich data that I had collected. Interviewees typically did not speak about their theories in a linear and logically coherent fashion. For example, they provided brief bits of information after recalling a particular transit planning experience. They also provided glimpses into their theories as they compared them with those found in the New Starts policies (a topic I raised). I clarified the theories that individuals espoused by condensing the often 50 pages of transcribed text into pithy and relatively linearly organized summations of the interviews.

As noted in Part C, comparing and contrasting these case studies helped me identify similarities and differences among the statements made by interviewees. Even without case studies, I was aware that most of my interviewees were reaching similar conclusions about the impacts of transit investments on real estate development. However, it was only in the development of the case studies that I was able to see how distinct people’s theories were regarding the causal linkages between transit investments and real estate development. Cases also helped me identify patterns across interviewees that led to my categorization of their espoused theories.

Interpretive analysis of interviews and policy documents

This dissertation investigation relied heavily on interpretive methods of analyzing text-based data from interview transcripts and policy documents. To identify patterns in the data, I used qualitative coding to rigorously interpret the material and categorically describe transit planning practices and outcomes. Much of this investigation’s focus on planning practice rests on the reflective and interpretive practice theories elaborated by Schon, Forester, and other scholars who have used qualitative methods to reveal patterns in professional practice and expose the underlying logic of practices (Argyris and Schon 1974; Schon 1983; Forester and Kreiswirth 1993). As part of this form of research, particularly in the policy realm, a keen understanding of both the official recorded history and remembered history of practice formulation and implementation helps illuminate theories—particularly causal pathways—that may otherwise be tacit in practice (Yanow 2000). My interpretive analysis focused on categorizing actions, motives, outcomes, and ideas.

In the following sections, I describe the process I used to interpret interview data in particular. This methodology contributed to the categorization of project impacts, the impetus for those impacts, and the taxonomy of theories.

Observing and theming interview transcripts

To inform the analysis of my coding structure, I performed a series of steps recommended by Bazeley and Jackson (2013). First, I read all of my interview transcripts and took referential notes that, in one or two sentences, described interesting aspects of the interview transcripts. Using NVivo software, I inserted a linked reference from the notes to the corresponding section of the interview. After descriptive sentences, I also wrote a brief explanation of why the
statement interested me. Then, I wrote a brief explanation of why that interesting statement contributed to the research questions being investigated.

After pursuing this note-taking process for 15 interviews, I paused to review my statements and identify some thematic concepts that could be used to describe and organize my observations. During this first cycle coding process I framed these high-level codes as research questions (Miles, Huberman, and Saldana 2014). I verified that each code related to my original research questions and that all of my research questions were addressed. From this abstraction exercise, I developed my initial thematic organizational structure. Per Bazeley and Jackson (2013), I took care not to produce a coding structure with substantial depth or specificity, so that I would maintain flexibility and could easily change my codes and structure to reflect new understanding of the evidence. The initial coding structure had two levels in a shallow tree structure.

These thematic codes informed subsequent interviews such that I gathered more evidence on these topics as more interviews were conducted. I repeated the process of describing interesting data elements across all of my interview data. Using the research question codes that I initially identified from the first 15 interviews, I began to apply the codes to all of the summary paragraphs that I had written.

Reaching saturation
I continued to conduct interviews and adapt my interview guide based on the themes emerging from my analysis until I reached a point of saturation (Becker 1998; Lofland et al. 2006; Yin 2009; M. L. Small 2009). As I was not seeking to understand the frequency of occurrences, at the point of saturation, I believed than any additional interview would not yield new information on the topic. As Mason (2010) explains, “Frequencies are rarely important in qualitative research, as one occurrence of the data is potentially as useful as many in understanding the process behind a topic.”

To determine that saturation point, I relied on two methods. First, I compared interview data with written policy documents. If interviewees had not discussed something identified within the FTA’s policies on the topic, I believed there was more to be discovered from additional conversations, either following up with individuals who I had already interviewed or by conducting additional interviews. Second, I occasionally interviewed individuals who I believed would provide a distinct perspective than those individuals I had previously interviewed. For example, I had conversations with several congressmen and rail transit critics. I anticipated both sets of individuals would have very different viewpoints on the relationship of transit investments and real estate development and how transit planning practices might be impacted. When document reviews and themes from conversations aligned with codes that I had already developed, I believed that I had reached a point where further discussion with additional transit planners was unlikely to yield new discoveries.

Detailed Codes
After developing a robust set of high-level thematic codes and applying them to the single summary document, I then set out to identify more patterns within the data. Using NVivo software to consolidate summary statements associated with a single code, I read through my evidence and notes to identify conceptual patterns within that theme. Through this second cycle coding process, I sought to categorize ideas, describe causation, record relationships, and capture theoretical constructs (Miles, Huberman, and Saldana, 2013). I produced an NVivo code for each
category and coded all of the relevant sections. Category codes evolved as I read and coded more summary paragraphs. I often combined codes, subdivided codes, or changed the name of codes as I read through more of the material.

**Writing about coded categories**

Upon a complete review of all of my summary statements to ensure each was associated with at least one code in my coding structure, I began to write about the categories. To do so, I used NVivo’s link feature to return to the original text associated with each code. Drawing from the original interviewees’ statements, I wrote about the actions taken by practitioners, the motives they provided for their actions, and the conflicts they described. I also wrote about the theories that they had shared with me regarding transit investments’ impacts on real estate development. In doing so, I identified issues with my categorizations, revised them in the NVivo coding tree structure, and re-evaluated their relationship to other categories.

Ultimately, the codes were useful in running NVivo queries on relationships. For instance, codes allowed me to query the number of regions where a particular real estate development-related planning practice took place. While much of the descriptive writing was irrelevant, some of the written material served as rough drafts for parts of this document.

**Communication of data**

I do not identify the individual participants in this dissertation. When I presented participants with a choice between being identified and remaining anonymous in the write-up of my research, many interviewees opted to remain anonymous. For consistency and to ensure the anonymity of those who chose to remain anonymous, I have taken several steps to present all of the research material such that the anonymity of all interviewees was maintained.

The gender of interviewees has been masked because women constitute a minority of practitioners in my sample and across this professional field. Identifying both the gender and organizational affiliation of an individual could make them easily identifiable. Therefore, all interviewees are described using masculine pronouns.

Additionally, the identities of some transit projects are concealed so that key planners will not be identifiable. Descriptions of some projects are also purposefully vague to conceal their identity. Finally, I conducted at least seven interviews relevant to each of the three transit project case studies both to triangulate from multiple sources and so that I could limit my reliance on quotes from any one interviewee, thus reducing the chance that I would reveal any individual’s identity.
PART B: Real estate development-inspired transit planning

Integrated transit and land use planning is not the exception it was once considered. I found that transit planners working on billions of dollars in transit investments have altered the phasing of projects, designed the alignment of projects, selected station locations, and designed station areas based on expectations that their actions would contribute to transit-oriented development around the projects they planned. Their efforts often came at considerable cost and many interviewees lamented the fact that their actions had not yielded all of the real estate development benefits they had expected, suggesting inefficiencies resulting from integrated transit and land use coordination activities. The key implication of the findings in this section is that ineffective transit planning practices may have costs that exceed the benefits and be widespread.

In this section, I discuss what 63 transit planners shared with me regarding how and why transit project planning processes and project designs were influenced by real estate development considerations in 18 regions. I also discuss particular transit project plans in three cities that were influenced by planners’ expectations for transit-oriented development. In contrast to the findings found in Part C of the document, which focus on the theories that planners espoused, the findings in this section rest on practitioners’ project-specific actions. Relying on the technical-rational model of planning, I investigated what planners planned, why they said they planned it that way, and the results of those planning decisions.

When asked about instances in which real estate development had been a prime consideration during their planning practices, interviewees were typically able to readily identify several instances when processes or designs were modified based on real estate development expectations. The elements of transit plans influenced by real estate development often negatively impacted capital costs, operating efficiency, ridership, and other factors of the projects. In fact, many interviewees also described real estate development-inspired modifications that they had hoped to implement on projects but were unable to because of their relatively high costs.

Interviewees were often able to clearly articulate why they sought to implement specific real estate development-inspired adaptations to transit plans, frequently describing more than one goal for a given action. For example, a planner in San Diego explained how they shifted the location of a station along an alignment to position it closer to (a) several underutilized commercial properties and (b) a zone where long-range regional plans had identified dense redevelopment. In this section, I discuss the diverse categories of goals described by transit planners.

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7 These findings are based on qualitative data analysis techniques and are not intended to be representative of the population of transit planners or transit projects.
8 As noted in Section A-2, interviewees discussed transit planning practices in 19 regions but in one region interviewees suggested that real estate was such a consistent and ubiquitous consideration that they were unable to pinpoint the specific impacts those considerations had on planning processes and project designs. They considered all of the system, project, and station design decisions they made to have rested partly on real estate development considerations along with other factors.
9 When interviewees explained their rationales for a particular action, it often served as an entry point to ask more questions about their broader theories-of-practice. For example, what about underutilized properties or regional plans made them indications of real estate development potential? Interviewees’ theories-of-practice are discussed in Part C of this document.
Further, transit planners sometimes discussed the real estate development that had resulted around the stations they planned. In some cases, it met expectations. However, in many instances it did not. Interviewees reflected on projects in a dozen regions where plans had been adapted to promote real estate development but, at the time of our interview, there had been less real estate development around transit stations than they had expected. In fact, no interviewee suggested that their expectations for transit-oriented development had ever been exceeded. The three case studies of transit projects presented in this section provide descriptions of such instances.\(^{10}\)

Based on the findings presented in this section, it is clear that transit planners have modified transit planning processes and project designs to influence transit-oriented development but their costly efforts have not always resulted in all of the benefits they anticipated. Because this study was not designed to quantify how inefficient such practices actually were nor was it designed to generalize findings to the full population of transit investments, future research should seek understand the overall inefficiencies of such practices across the U.S. transit industry. While the inefficiencies may be found to be relatively innocuous, significant effort to improve transit planning efficacy may be warranted if the inefficiencies are found to be relatively large.

**Acting on real estate development-inspired transit planning opportunities**

Several interviewees suggested that they did not always react to all of the possibilities they had to align transit investments with real estate development opportunities, though they were generally able to incorporate some real estate development-related features into transit project plans. They suggested that other transit project goals, local policies, or New Starts funding constraints precluded some real estate development-related project planning or design impacts. The costs associated with promoting real estate development—such as rerouting transit lines or constructing stations on expensive property in strong markets—were often the prime hindrance.

In some instances, interviewees suggested that real estate development considerations had little impact on transit planning processes or transit project designs because they were superseded by local policies and practices. In one case, a transit planner explained that his agency’s charter restricted them from procuring land. The agency had to rely on local governments to condemn land and transfer use rights to the transit agency for right of way and station area access. The result was a predilection toward low cost right of way and even the selection of station locations near low-cost land. In effect, this reduced the agency’s ability to align transit with dense development or attractive markets for real estate development opportunities.

Even when real estate development was a front-of-mind consideration, planners explained that it was part of a complex balancing act they carried out to get projects constructed—their ultimate objective. As one regional planner in Portland explained, “We have all of these intense tradeoffs, some of them political some of them community oriented, some of them environmental, some of them federally regulated, some of them state regulated, locally mandated things. So we’re constantly trying to find the right balance and that’s often difficult. And development is just one piece of that very complicated tradeoff system.”

It was also the case that the real estate development considerations had limited influence on planning and design because they were a relatively minor consideration. In particular, numerous

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\(^{10}\) Often, planners would explain why they thought their efforts had not resulted in the anticipated real estate development. When interviewees explained unmet expectations, it often served as an entry point to delve into their broader theories-of-practice. Interviewees’ theories-of-practice are discussed in Part C of this document.
interviewees discussed the greater relative influence of cost and ridership forecasts. Several transit agency planners noted that project cost and project ridership were of paramount importance and overwhelmed any considerations of real estate development. For example, a transit planner explained that he spent several days each year meeting with his agency’s board members and other public officials to explain why a transit project with few potential riders but high real estate development potential (for example, a light rail extension to greenfield properties on the edge of a region’s developed area) was not a viable option due to the relatively high costs of extending rails to the developable areas. Though he believed such transit investments could support development in those locations, he knew that the proposal would be rejected for New Starts funding and the project’s performance would be a political liability for the transit agency.

Another planner explained that he wished to modify transit plans to optimize development but was hamstrung by the fundamentals of transit system planning: basic cost constraints, the need to achieve certain cost recovery thresholds, and political pressures for geographic equity and social equity. A transit planner in Charlotte described the tension he felt as he considered the tradeoffs, “I sometimes wonder about putting TOD ahead of transportation engineering.” Another transit planner described the tradeoffs metaphorically as a balancing scale with engineering on one side and transit-supportive development on the other. In his interpretation, promoting transit-supportive development consistently required higher costs and potentially fewer riders in the near-term.

In fact, several of the FTA staff explained that real estate development has often been a casualty of New Starts funding criteria as projects shave costs and add park-and-ride facilities that lure more ridership. An FTA staff person explained that in the case of the Central Corridor in Minneapolis-St. Paul, arguments for more stations were based on economic development and real estate development potential. That project led to a 2009 change in the New Starts rules that removed the threshold requirement for cost effectiveness. In spite of this, one transit planner suggested that the FTA is so risk averse that cost factors, though weighted the same as many other New Starts evaluation factors, remain the main focus for FTA staff and New Starts application evaluators.

As a planner explained, both the FTA and transit agencies still focus on low cost alternatives because it is fundamental to delivering a regional transit system. In fact, he considered his primary professional objective to be the delivery of projects approved and accepted by voters. He believed projects that bent over backwards to accommodate real estate development but underperformed operationally would affect the public’s trust in the agency.

In addition to being superseded by politics, real estate development considerations were also superseded by the essentials of project delivery. Several interviewees explained that complex projects that incorporated additional stakeholders (e.g., major landowners, real estate developers, existing firms and residents) and non-standard designs (e.g., stations incorporated into new development, shared parking facilities) threatened the agency’s ability to deliver projects “on time and under budget.”

Likewise, another transit planner pointed out that benefits and costs will always be a prime concern of planners. While in his opinion the New Starts program’s evaluation criteria seem to change every few years, he had not seen a change in the industry’s long term consideration of ridership and capital costs as the primary benefits and costs. He considered them “timeless” measures of transit project efficiency.
Several interviewees also made remarks reflective of the uncertainty of achieving transit-supportive development. A transit planner suggested that the focus on costs and riders and de-emphasis of real estate development was appropriate. He contrasted the speculative nature of the transit-supportive development to the predictability of both transit project costs and ridership (he did not acknowledge that the academic literature is replete with criticism regarding the accuracy of both cost and ridership forecasts).

In contrast, another planner suggested that the transit planning profession’s unwavering focus on low-cost projects has limited the transit supportive development outcomes. He explained that real estate development opportunities are often found in strong markets with higher real estate costs. These higher real estate costs can impact project costs if right-of-way must be procured to bring transit proximate to the real estate development opportunities. Thus, achieving real estate development goals may run counter to the primary cost-focused objectives of transit planners, New Starts project evaluators, and other project stakeholders.

**Diverse impacts on transit planning processes and project designs**

In spite of the costs that were often associated, interviewees indicated that there were a number of ways that real estate development concerns had impacted transit planning practices and transit project designs in their experience. Through my interpretive analysis, I set out to describe and then categorize the impacts. Based on the categorization process described in Section A-2, I found that interviewees described 23 distinct types of real estate development-related impacts to transit planning processes or project designs. In my interpretation, these could be further classified into four groups: phasing impacts; route, alignment, or mode impacts; station design and or station area design impacts; and station position impacts. This section describes these impacts.

**Phasing impacts**

Through interviews, I learned of several instances when the phasing of transit project’s had been informed by real estate development. In several of those instances, the real estate development-related New Starts funding evaluations played a role in the decision to reprioritize projects in the system plans. As one planner explained, “We only put forward projects that we know will score well on New Starts funding applications.” Prior research found that the introduction of the real estate development-related New Starts policy led to changes in the prioritization of transit projects (Deakin et al. 2002; Deakin, Payne, and Menotti 2004). However, interviewees also mentioned reprioritizing projects on the basis of real estate development impacts irrespective of the New Starts policy.

Additionally, several interviewees mentioned that they had timed the construction or opening date of a transit project to coincide with particular real estate developments or other investments associated with real estate development. For example, one transit agency planner noted that he timed the construction of a project to coincide with infrastructure investments being carried out by the local redevelopment agency so that real estate investors were not deterred by the extensive construction impacts that could have resulted from serial rather than parallel construction timelines.
Route, alignment, or mode impacts

Interviewees also detailed several instances when routes, alignments, or modes were impacted by real estate development considerations. For example, interviews revealed that real estate was a consideration in the identification of potential routes and right-of-ways. Some routes were identified with real estate development as one consideration among many. One regional planner in Atlanta explained how his team tested numerous potential transit routes and one of their many objectives was to connect fast growing areas where development was occurring. In other cases, entire routes were inspired by land use plans or planned real estate investments. The Charlotte case study below is one example of a route that many interviewees suggested was initially inspired by regional land use plans and the region’s vision to concentrate real estate development along transit lines. In another set of cases, planners thought that prospective real estate investment had actually inspired the implementation of transit. For instance, one former industrial area in Boston was experiencing significant development pressures but had limited access to the city’s transportation network. Planners sought to enable the dense development that investors hoped to deliver in the area by providing a transit intervention that added more transportation access.

My interviews also revealed numerous instances when planners had considered real estate development when designing alignments. The scale of the impacts on plans varied. At the expensive end of the scale, planners described being inspired by real estate development potential to change entire alignments so that stations could serve development. For example, the Tyson’s Corner segment of the Dulles Rail project in Northern Virginia was diverted from less expensive right-of-way (e.g., highway medians, former freight railroads) for several miles at enormous cost. Some transit plans were modified to align a station with a particular development. For example, the end of one San Diego route was “wiggled” so that the terminus station coincided with a mall that was being expanded. In another instance on the Mid-Jordan project in Salt Lake City, the route was modified to bring stations to the heart of a grassy plain where deer were frequently spotted during transit construction and developers—who dedicated the right-of-way for the project—planned to build a new town center. On the less costly end of the scale, planners added at-grade crossings to help spur transit-supportive real estate development. As discussed in the Charlotte case below, planners were inspired by Smart Growth and New Urbanist principles to maximize granularity of the street grid, thus additional at-grade crossings were required. They added the at-grade crossings in spite of safety concerns, higher capital costs, and slower operating speeds.

In two instances, planners described selecting the mode of transit for a particular corridor based on real estate development potential. In one instance, a transit planner in Phoenix described how his agency arrived at the decision to build a streetcar rather than light rail to serve an area where the local government hoped to spur real estate development. The streetcar allowed transit planners to build more stations on decoupled alignment so that more land area would be encompassed by the 1/2-mile circles drawn around stations, zones of likely real estate development impacts. In another instance, planners in Austin considered the allowable densities in land use plans as they developed system plans. Higher allowable densities were justification for light rail while lower allowable densities only justified commuter rail services. In Austin’s case, the planners did not focus on existing densities because project delivery was in the distant future and the real estate development allowed in plans was expected to occur in the interim, especially once developers realized rail transit would serve certain areas.
Right-of-way is one of the major cost categories for any transit project and it is generally carefully considered to ensure project feasibility. Right-of-way and transit mode also define operational characteristics and other considerations like safety. Also, alignment designs (e.g., elevated trackway, roadway median), which are frequently informed by transit mode, vary considerably in cost. Real estate development-related changes to either routes or mode can affect project costs considerably and such costs can be relatively accurately predicted. Yet, in many of the cases that interviewees described expending considerable resources to change right-of-way or alignments based on real estate development considerations, the real estate-related benefits were highly prospective.

**Station design and/or station area design impacts**

In addition to discussing phasing impacts and impacts to routes and alignments, interviewees also noted several instances when real estate development considerations had impacted transit station designs. Interviewees discussed impacts to pedestrian access designs, parking lot designs, and automobile and bus access designs.

Of instances when interviewees described such design changes, the most frequent were impacts to pedestrian access points. Transit planners aligned station entrances with particular redevelopment sites or positioned points of egress to coincide with potential retail development. In Honolulu, planners had fielded calls from landowners interested in aligning station entrances with their developments and the transit agency staff and consultants were in the process of developing value capture strategies and planning heuristics to deal with the complexities of those situations when we spoke. In at least two cases, transit agencies had assigned several of their staff to teams tasked with interacting with landowners and discussing opportunities to align station access points with future development.

In other instances, planners discussed how parking facilities had been constructed with development in mind. For example, planners described how surface parking lots were sometimes designed with the expectation that they would later be redeveloped. In other cases, transit agencies spent considerable sums to build parking garages rather than surface parking lots so that vacant land near stations would remain available for development. In Charlotte, a transit planner discussed downsizing a parking lot to make the station area more pedestrian friendly and more likely to develop. In another instance, a transit planner discussed the extreme lengths his agency went through to preserve a station as a walk up station where transit-oriented development could occur. Over the course of many public meetings and interactions with elected officials, they argued against local neighborhood activists that said a parking lot was necessary and that the absence of park-and-ride stalls would not lead to overflow parking in their community.

In several cases, transit planners also designed bus access and auto access points to support real estate development in station areas. In some instances, planners sought to diminish the land area occupied by bus turnaround facilities to allow for more developable areas. In other cases, planners enhanced automobile facilities to maximize development potential. The discussion of Tyvola and Arrowood stations in the Charlotte case study below highlights examples where transit planners designed transit access roads and park-and-ride facilities so that transit agency investment in infrastructure also provided automobile accessibility benefits to properties they considered opportunities for transit-oriented development.
Station position impacts

In addition to all the aforementioned impacts to transit planning processes and project designs, interviewees frequently discussed how real estate development considerations informed where stations were sited. For the most part, interviewees described how the potential for real estate development informed where they sited stations in initial system and project plans, prompted them to relocate stations up and down alignments like moving pearls on a string, and motivated the addition of infill stations along lines.

During numerous interviews, I learned of instances when a station had been initially proposed because of real estate development potential. Planners described laying out routes and then looking at the long line on the map to find obvious locations approximately one mile apart where stations would be successful. In many instances, the presence of a large vacant parcel or a brownfield led planners to position a station where they thought it could support or spur development. In numerous instances, transit planners looked at local land use plans and located stations in places where plans called for high density development. For example, planners in San Diego located several stations on their trolley system where planners had indicated high density development was allowed.

In other cases, planners placed stations on the map initially and then adjusted them later when they learned of real estate development potential. The Dallas case study below highlights two instances when stations were moved up and down an alignment based on real estate development considerations. In another case, a transit planner described his successful struggle to locate a station at a historic commuter rail station against the desires of the agency’s engineering staff that argued the curved section of track was inappropriate for a modern station platform. The historic station area was considered more attractive for Smart Growth development by transit planners than the location initially identified by engineers. In another instance, a station on Portland’s WES Commuter Rail project was moved because local officials did not want to spur real estate development in the original location. To preserve the character of the area, the station was moved to a location where dense transit-oriented development was considered more appropriate.

In a number of instances, transit plans did not originally call for a station and planners added one based on real estate development considerations. The Plano station described in the Dallas case study below is an example of a station that was added to plans based on real estate investment and economic development potential. Several planners in Portland claimed that the Beaverton Round station on the Westside MAX line was the first time an FTA sponsored project had included a station purely for development potential rather than projected ridership. In that instance, it was added to plans when Portland planners felt comfortable that the New Starts program would still provide funding for the project with the additional station. In some other instances, interviewees described how stations were included in plans as “optional” station locations to be delivered after project construction when there was evidence that real estate development in the area could generate ridership that justified a station.

During interviews, three other types of real estate development-related station siting decisions piqued my interest. In one instance, a transit planner in Portland discussed how his region was seeking to reduce the number of stations on any given investment to make station access a rare resource. In spite of significant smart growth planning, several interviewees suggested that their region had not seen as much development around transit as anticipated. One explanation was that
there was a glut of transit stations and the tremendous supply meant that investors no longer saw transit stations as exclusive locations to develop. Therefore, the transit planner explained how they sought to eliminate as many stations as possible on recent and future lines and touted the relatively few stations on the agency’s most recent investments.

In another instance, a transit planner in Los Angeles described how he located stations to foreclose opportunities for auto-oriented development. This planner described going out of his way to site stations on vacant parcels in ways that would prevent a developer from building parking, either in an underground or above ground structure. He explained that those locations could promote a car-free lifestyle by limiting the ability of property owners to use their land for anything but an ideal smart growth development.

The third action was mentioned by multiple individuals working in different regions: San Diego, Charlotte, and Minneapolis. Whereas some interviewees described adding stations to a project because of development potential in a particular location, other interviewees described adding or maintaining stations for other reasons but justifying it based on real estate development potential. They did so even though they knew there was a low likelihood of development.

In one set of cases, planners needed to retain stations for political reasons in spite of the fact those stations were projected to severely underperform based on ridership or cost effectiveness. The stations were often in remote or inaccessible areas with a low likelihood of attracting walk-up patrons or even park-and-ride patrons. The potential for real estate development in these vacant areas was often used to justify the decision.

In another set of cases, planners described adding infill stations when there were long stretches of alignment passing through undeveloped areas. In some cases, they wanted to serve communities in transit tax-paying jurisdictions with rail stations so that the station access would balance the white elephant impacts of the rail passing through. In others, they sought to connect distant nodes and were reluctant to propose a project with stations only at the two ends of the alignment. Such plans result in relatively high costs per station and could have highlighted that an urban transit solution was being planned for a low-density area. Therefore, planners added stations between the major destinations and justified their existence based on real estate development. In one interview, a planner in Portland began to exhibit guilt as he explained this but then qualified his statement by saying that he wouldn’t have added the interstitial stations if he had not thought there was a chance the station areas could eventually develop.

For all of these station siting choices, there were capital, operational, and other effects. It was not always clear that interviewees understood all the implications of their decisions as they explained them to me.

All of my classifications of real estate development-related transit planning practices are described in the table below. Although not a representative sample, the table also describes the frequency of impacts across regions. Prior to this research, scholars’ understanding was that the reprioritization of projects occurred in several regions (Deakin et al. 2002; Deakin, Payne, and Menotti 2004) and that other types of transit planning actions were possible. This research found that numerous actions have been taken and that many have occurred in more than one region.
Table 8 – Real estate-related planning process and project design impacts

<table>
<thead>
<tr>
<th>Specific planning process and project design impacts</th>
<th>Percent of 19 regions where impacts occurred&lt;sup&gt;11&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phasing impacts</strong></td>
<td></td>
</tr>
<tr>
<td>Reprioritized transit investment among others</td>
<td>21%</td>
</tr>
<tr>
<td>Timed transit investment to coordinate it with other investment(s)</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Route, alignment, or mode impacts</strong></td>
<td></td>
</tr>
<tr>
<td>Added at-grade crossings</td>
<td>11%</td>
</tr>
<tr>
<td>Entire transit route arose out of regional or local land use vision</td>
<td>26%</td>
</tr>
<tr>
<td>Identified route(s) with real estate development as the prime consideration</td>
<td>37%</td>
</tr>
<tr>
<td>Identified route(s) with real estate development as a consideration</td>
<td>32%</td>
</tr>
<tr>
<td>Jogged alignment off of primary right of way</td>
<td>42%</td>
</tr>
<tr>
<td>Selected a different right of way</td>
<td>21%</td>
</tr>
<tr>
<td>Determined transit mode</td>
<td>11%</td>
</tr>
<tr>
<td><strong>All station-related impacts</strong></td>
<td></td>
</tr>
<tr>
<td>Station design and/or station area design impacts</td>
<td>79%</td>
</tr>
<tr>
<td>Built auto and/or bus access</td>
<td>37%</td>
</tr>
<tr>
<td>Built parking garage</td>
<td>5%</td>
</tr>
<tr>
<td>Built surface parking</td>
<td>5%</td>
</tr>
<tr>
<td>Designed station and/or access to promote real estate development</td>
<td>5%</td>
</tr>
<tr>
<td>Physically integrated station into new development</td>
<td>11%</td>
</tr>
<tr>
<td>Removed or reduced size of park and ride facilities</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Station position impacts</strong></td>
<td></td>
</tr>
<tr>
<td>Added infill station(s) after opening</td>
<td>74%</td>
</tr>
<tr>
<td>Added infill station(s) between stations that were long distance apart</td>
<td>16%</td>
</tr>
<tr>
<td>Added infill station(s) to plans</td>
<td>26%</td>
</tr>
<tr>
<td>Dropped station(s) from plans</td>
<td>11%</td>
</tr>
<tr>
<td>Positioned station(s) to foreclose auto-oriented development options</td>
<td>5%</td>
</tr>
<tr>
<td>Retained low-ridership station(s)</td>
<td>11%</td>
</tr>
<tr>
<td>Shifted planned station(s) like pearl on string</td>
<td>53%</td>
</tr>
<tr>
<td>Sited planned station(s) for real estate development purposes</td>
<td>58%</td>
</tr>
</tbody>
</table>

The goals of real estate development-inspired transit plan elements

As they described the ways that the potential for real estate development had informed transit planning processes and project designs, I asked interviewees to clarify the real estate development-related intentions of their transit planning actions. For example, “How did moving the station influence real estate development?” Based on the accumulated data, I used the categorization process discussed in Section A-2 to find patterns among the wide ranging set of transit planners’ real estate development-related rationales. Based on this analysis, I identified eight high-level goals for the real estate development-related impacts to transit planning processes and project designs that interviewees’ described. All are discussed below. Though my

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<sup>11</sup> At least one interviewee stated that transit plans had been influenced by real estate development considerations

<sup>12</sup> As noted in Section A-2, interviewees discussed transit planning practices in 19 regions but in one region interviewees suggested that real estate was such a consistent and ubiquitous consideration that they were unable to pinpoint the specific impacts those considerations had on planning processes and project designs. They considered all of the system, project, and station design decisions they made to have rested partly on real estate development considerations along with other factors.
work was not based on a representative sample, I then provide a table with all of the intentions and the extent to which they were applicable across regions to aid researchers conducting future work on the topic.

The first goal related to existing development. Several interviewees suggested that they were planning transit projects to align them with ongoing development projects. For example, planners in Eugene described rerouting their second BRT project’s alignment to wind through the access roads of a new hospital campus that was in development at the same time as the transit project. Transit planners also sought to align projects with public sector real estate development. Planners in Portland discussed locating one station near a site where a university had proposed building a classroom facility. In both examples, planners thought the real estate developments could be the first of many in the station area.

Some interviewees suggested that they modified transit plans to align stations with prospective development. Interviewees suggested that they had located stations near redevlopment areas or public land that was slated for development. For example, transit planners in Phoenix aligned stations near failed malls to help local governments’ efforts to redevelop the blighted properties. In addition, transit planners aligned projects with locations that were identified as development sites in local land use plans or regional land use visions. The case study of Charlotte’s South Corridor below exemplifies this. Also, several interviewees suggested they had designed transit projects to support the rejuvenation of older downtowns or former streetcar nodes. For example, planners in Fresno suggested that the rerouting of the city’s BRT would contribute to revitalizing the downtown area and capture increased ridership as redevelopment occurred.

In some instances, interviewees explained that their decision to adapt transit plans was not based on in-progress development or prospective development but based on aligning transit infrastructure with locations that they considered developable. Their defining characteristics of developability were numerous. For example, interviewees suggested that they looked for sites far from highways or other nuisances that might discourage productive use of the properties while they also looked for sites close to heavily trafficked areas or intersections such that retail might thrive. As in the case of the Bush Turnpike station in the Dallas case study below, transit planners also suggested that large parcels consolidated under single-ownership were likely development candidates. Likewise, parcels with environmental issues (i.e., brownfields), properties in low density former industrial areas, and low-density car-oriented commercial areas were considered potential redevelopment sites due to their low existing lot usage. Interviewees suggested that vacant parcels were particularly ripe for development. In some instances, interviewees described designing stations to yield vacant, remnant parcels that they considered developable.

Interviewees also suggested that they adapted transit plans specifically to promote Smart Growth development. For example, a transit planner in Washington D.C. explained how his planning team went to great lengths to locate the Largo Town Center Station proximate to large parcels slated for redevelopment because the property owners of the former NBA arena on the site sought to develop a New Urbanist transit village. Interviewees also attempted to maximize the accessible area within a half-mile of stations because that was the area of influence where Smart Growth development was likely to occur. In addition, transit planners positioned stations in locations they deemed appropriate for Smart Growth development due to tighter street grids and more walkable land uses.
Interviewees also discussed adapting project designs so that transit construction would support real estate development. For example, transit planners in several cities talked about siting stations such that unsightly buildings would have to be demolished and properties could be redeveloped.

In some instances, interviewees described their efforts to plan projects so that the transit agency could benefit financially from potential real estate development. For example, transit planners working in San Diego shifted a station along an alignment to be adjacent to a large property that the transit agency was expected to purchase as part of the right of way acquisition process. Likewise, transit planners designed stations so that parking lots and other sites could facilitate joint development on the transit agency’s property. Interviewees also described adapting transit plans to reap benefits from private real estate development nearby. For example, transit planners in Hawaii described efforts to work with real estate developers to fund the construction of station entrances that would be accessed through private buildings. Similarly, transit planners working on the Dulles rail project through Tyson’s Corner worked with their agency’s real estate team and Fairfax County planners to upzone parcels in exchange for parts of properties that were needed for transit right of way. Such property transactions cost little for the transit agency or the local government. As was the case with the Bush Turnpike station described in the Dallas case study below, transit agencies also located stations where landowners would contribute land or funding to aid the construction of transit projects.

In some instances, the potential for future development was a used as a tool by transit agencies to capture financial benefits from the FTA. For example, planners in one jurisdiction suggested that stations had been added to a project to support local development efforts and increase their score on the real estate development-related New Starts funding criteria. In another case, transit planners in Massachusetts described the development of an infill station at Assembly Square as an effort to promote redevelopment but also a means of attracting attention to the high-quality transportation planning occurring in the state. The project was not a New Starts project but one interviewee suggested that any proof that they were a “progressive” agency would help them attract more federal funding in the future.

Lastly, interviewees adapted transit designs because of transit’s perceived negative externalities. For example, transit planners in Salt Lake City described their efforts to select station locations that served proposed developments while also positioning them to avoid excessive disturbance from the combined construction of buildings and transit. In another example found in the Portland case study below, early plans for the Interstate MAX project had avoided positioning the alignment in industrial areas on the eastern banks of the Willamette River because the local government and transit planners feared that the presence of transit infrastructure would lead to redevelopment in an area that the City hoped to preserve as light industrial land uses.

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13 As seen in Table 9, interviewees in very few regions suggested that FTA and the New Starts program played a role in the real estate development-related impacts to transit planning processes and project designs (see ‘Influenced FTA perceptions’ category in the table). The original hypotheses tested by this research were related to the impact of the real estate development-related elements of the New Starts policies on transit planning practices. It was found that the New Starts policies were merely reflective of a much larger discourse on transit’s relationship to Smart Growth urban development that permeated both policy and practice. There was greater evidence that the policies reinforced other theories and practices rather than directly defining transit planning practices. The evidence gathered for this research could not say with certainty that changes to the New Starts policies would have widespread influence on the practices of transit planners.
Table 9 – Real estate development-related goals of planning actions

<table>
<thead>
<tr>
<th>Classes of practitioners’ stated real estate development-related goals for the transit project planning process and design impacts that were implemented</th>
<th>Percent of 19 regions where goal was associated with a project impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aligned transit investment with ongoing development</strong></td>
<td>53%</td>
</tr>
<tr>
<td>Close to proposed or in progress development project</td>
<td>53%</td>
</tr>
<tr>
<td>Near public sector development project</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Aligned transit investment with prospective development</strong></td>
<td>89%</td>
</tr>
<tr>
<td>Located station near redevelopment area or public land slated for development</td>
<td>58%</td>
</tr>
<tr>
<td>Supported growth or projects identified in local land use plans</td>
<td>74%</td>
</tr>
<tr>
<td>Supported growth or projects identified in regional plans</td>
<td>58%</td>
</tr>
<tr>
<td>Supported the rejuvenation of older downtowns or former streetcar nodes</td>
<td>47%</td>
</tr>
<tr>
<td><strong>Placed transit stations proximate to developable locations</strong></td>
<td>63%</td>
</tr>
<tr>
<td>Added distance from highways or other nuisances</td>
<td>21%</td>
</tr>
<tr>
<td>Located close to brownfields and former industrial areas</td>
<td>32%</td>
</tr>
<tr>
<td>Located close to car-oriented commercial and retail parcels</td>
<td>21%</td>
</tr>
<tr>
<td>Located close to heavily trafficked area or intersection</td>
<td>11%</td>
</tr>
<tr>
<td>Located close to high growth area</td>
<td>26%</td>
</tr>
<tr>
<td>Located close to vacant parcels</td>
<td>53%</td>
</tr>
<tr>
<td>Located near large or consolidated single-owner parcels</td>
<td>47%</td>
</tr>
<tr>
<td>Located stations to leave land where landowners could develop</td>
<td>42%</td>
</tr>
<tr>
<td><strong>Promoted Smart Growth development</strong></td>
<td>63%</td>
</tr>
<tr>
<td>Enabled Smart Growth-New Urbanist station area concepts (e.g., car free, walkability)</td>
<td>53%</td>
</tr>
<tr>
<td>Maximized land area in half-mile circles accessible to transit</td>
<td>16%</td>
</tr>
<tr>
<td>Positioned transit in location deemed appropriate for Smart Growth</td>
<td>32%</td>
</tr>
<tr>
<td>Reduced land area in half-mile circles to limit supply of transit access</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Captured benefits of transit construction for real estate development</strong></td>
<td>32%</td>
</tr>
<tr>
<td>Improved potential development parcels with new road, bike, bus access</td>
<td>21%</td>
</tr>
<tr>
<td>Used station placement as opportunity to demo an unsightly building</td>
<td>21%</td>
</tr>
<tr>
<td><strong>Captured fiscal benefits</strong></td>
<td>47%</td>
</tr>
<tr>
<td>Located station where joint development could occur—near land transit agency already owned or would have to take regardless</td>
<td>11%</td>
</tr>
<tr>
<td>Preserved and optimized joint development opportunities</td>
<td>16%</td>
</tr>
<tr>
<td>Real estate development provided transit operations or construction cost benefits (e.g., station entrances built in new buildings)</td>
<td>11%</td>
</tr>
<tr>
<td>Reduced costs by siting station where a landowner would contribute land or money to transit project</td>
<td>21%</td>
</tr>
<tr>
<td>Used future development to justify present investment in transit infrastructure (e.g., stations)</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Influenced FTA perceptions</strong></td>
<td>26%</td>
</tr>
<tr>
<td>Improved real estate development-related New Starts evaluation score</td>
<td>21%</td>
</tr>
<tr>
<td>Provided evidence agency was a progressive project sponsor (may not be a New Starts funded project)</td>
<td>21%</td>
</tr>
<tr>
<td><strong>Reduced transit impacts</strong></td>
<td>21%</td>
</tr>
<tr>
<td>Moved away from buildings, businesses, or developments to avoid disturbance</td>
<td>21%</td>
</tr>
<tr>
<td>Moved away from certain sites to avoid their redevelopment</td>
<td>5%</td>
</tr>
</tbody>
</table>
**Transit project case studies**

This section describes details of several transit projects to illuminate how real estate development has played a significant role in transit planning and resultant project designs. Each case demonstrates how significant real estate development-related project design features can be and the fact that the anticipated real estate development benefits did not always come to fruition as anticipated by project planners.

I conducted case study investigations of three transit projects in three metropolitan areas.\(^{14}\) The case studies represented significant investments in fixed-guideway transit with regular service patterns, were designed and delivered during the post-ISTEA era,\(^{15}\) and were located in growing regions with reasonable expectations for real estate development. In particular, I selected all three because of the opportunity to investigate research questions and hypotheses regarding the impact of the real estate development-related New Starts policies on transit planning practice—a research route that changed as my qualitative study progressed. Further discussion of the case selection process can be found in Section A-2.

**Table 10 – Attributes of case study settings and transit projects**\(^{16}\)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Charlotte South Corridor</th>
<th>Dallas North Central</th>
<th>Portland Interstate MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSA where project is located</td>
<td>Charlotte, NC-SC</td>
<td>Dallas-Fort Worth-Arlington, TX</td>
<td>Portland-Vancouver-Beaverton, OR-WA</td>
</tr>
<tr>
<td>Population of the MSA</td>
<td>1,706,469</td>
<td>6,301,085</td>
<td>2,203,745</td>
</tr>
<tr>
<td>Directional Route Miles of transit service in MSA</td>
<td>1,607</td>
<td>2,296</td>
<td>2,017</td>
</tr>
<tr>
<td>Walkscore for all stations in MSA (1-100)</td>
<td>69</td>
<td>58</td>
<td>73</td>
</tr>
<tr>
<td>Daily parking rate in the primate CBD</td>
<td>$10.35</td>
<td>$5.89</td>
<td>$8.75</td>
</tr>
<tr>
<td>Project mode</td>
<td>LRT</td>
<td>LRT</td>
<td>LRT</td>
</tr>
<tr>
<td>Type of project</td>
<td>New system</td>
<td>Extension</td>
<td>Expansion</td>
</tr>
<tr>
<td>One seat ride to CBD</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year project opened</td>
<td>2005</td>
<td>2002</td>
<td>2004</td>
</tr>
<tr>
<td>Capital cost (SMM)</td>
<td>$428.5</td>
<td>$450.4</td>
<td>$333.3</td>
</tr>
<tr>
<td>Route miles of the project</td>
<td>9.6</td>
<td>12.5</td>
<td>5.8</td>
</tr>
<tr>
<td>Percent of project at grade</td>
<td>98%</td>
<td>81%</td>
<td>88%</td>
</tr>
<tr>
<td>Number of park and ride spaces</td>
<td>Unavailable</td>
<td>5,758</td>
<td>604</td>
</tr>
<tr>
<td>Frequency of trains in peak AM hour</td>
<td>12</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Number of bus line connections</td>
<td>Unavailable</td>
<td>37</td>
<td>18</td>
</tr>
<tr>
<td>Jobs within 1/2 mile of stations</td>
<td>Unavailable</td>
<td>57,228</td>
<td>16,343</td>
</tr>
<tr>
<td>Residents within 1/2 mile of stations</td>
<td>20,794</td>
<td>20,750</td>
<td>18,279</td>
</tr>
<tr>
<td>Observed average weekday ridership</td>
<td>~15,000</td>
<td>12,304</td>
<td>7,992</td>
</tr>
</tbody>
</table>

\(^{14}\) I evaluated these three sites for this dissertation in coordination with case study research that I carried out for the Transit Cooperative Research Program’s project number H-42 (Daniel G. Chatman et al. Forthcoming).

\(^{15}\) The Intermodal Surface Transportation Equity Act of 1991 was the first time federal law required the consideration of future land use patterns as a grant making criterion.

\(^{16}\) Table adapted from TCRP H-42 working draft (Daniel G. Chatman et al. Forthcoming).
Based on evidence gathered from reviewing public reports and other planning documents, conducting site visits, and interviewing transit planners, MPO officials, and consultants who had worked on the projects, I developed historical descriptions of the transit planning processes from start to finish and from multiple vantage points. I rely on interviews with eight transit planning professionals for the Portland case, seven for the Dallas, and eight for the Charlotte case. Triangulating from the diverse sources, the narratives illuminated the variety of viewpoints on real estate development that co-existed, the ways that real estate development considerations become integral to planning processes, and the ways real estate development considerations are balanced with ridership, capital costs, and other goals. The case studies presented here have been condensed from the case study materials that I developed during the analysis phase to focus on evidence that reveals specific patterns regarding transit and land use coordination practices.

Reflecting what the academic literature suggests about aligning transit projects with real estate development potential, the cases confirmed that transit project planners had selecting routes and locating stations in ways they considered supportive of real estate development around transit investments. Cases show how the tradeoffs made by planners were complex, and the design implications were often profound. In several instances, the benefits that transit planners expected from their actions were both tangible—for example, real estate development—and intangible—for example, political support for the project.

In Portland, planners selected a route for the Interstate MAX project based on the inevitability of real estate development around stations even though a less expensive, higher ridership alternative existed. In Dallas, planners went out of their way to add stations and modify station locations on the North Central Corridor to promote real estate development along a line that was conceived of primarily as a park-and-ride-oriented investment aimed at reducing automobile congestion along a parallel freeway corridor. In Charlotte, transit planners and land use planners worked as a team to develop plans for the South Corridor that included numerous features—additional grade crossings, closely spaced stations, a realignment from the primary right of way—aimed at promoting transit-oriented development. Planners in all three regions had difficulty estimating what the costs had been for the real estate development-inspired elements but it was clear that considerable staff resources, political capital, and money had been expended to incorporate many of them into the projects.

Ultimately, some transit-oriented development had occurred around each of the transit investments by the time I gathered my evidence in 2012; seven, eight, and ten years after services began on the three projects. However, in spite of costly and time-consuming transit planning considerations inspired by prospective real estate development, transit-oriented development often had not come to fruition in many station areas at the scale or in the timeframe anticipated by transit planners.

In Portland, interviewees suggested that all of the development that had occurred would have without the project and their overall expectations for major investment along the Interstate Avenue corridor have not come to fruition. In Dallas, development had occurred around two of three stations where major real estate investment had been anticipated. However, the amount of development fell short of that envisioned in the land use plans that had established transit planners’ expectations. While the Charlotte transit corridor experienced significant development around many stations, no development had occurred around what many planners described as their showcase effort to promote real estate development by modifying transit infrastructure. Transit-oriented development at that station was considered imminent when the project opened.
and, as one Charlotte transit planner noted wryly during our interview, was still considered imminent by everyone in the agency at the time I conducted my research.

These case studies demonstrate that the costs associated with real estate development-related transit planning practices do not always yield all of the expected benefits that justified them. I summarize my interpretation of the case study findings in the following table using a three-part relative scale: Minimal, moderate, major. To be clear, this table is not based on a quantitative evaluation and should be read as my impression based on the collective information provided by interviewees. Future research can quantify the actual costs and benefits of the actions taken.

Table 11 – Qualitative interpretation of case study findings

<table>
<thead>
<tr>
<th>Project characteristic</th>
<th>Interstate MAX—Portland, OR</th>
<th>North Central DART LRT—Dallas, TX</th>
<th>LYNX South Corridor—Charlotte, NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale of transit planning actions based on real estate development</td>
<td>Major</td>
<td>Moderate</td>
<td>Major</td>
</tr>
<tr>
<td>Costs of real estate development-related actions</td>
<td>Major</td>
<td>Minimal</td>
<td>Major</td>
</tr>
<tr>
<td>Expectations for real estate development based on actions</td>
<td>Major</td>
<td>Major</td>
<td>Major</td>
</tr>
<tr>
<td>Actual real estate development outcomes based on actions</td>
<td>Minimal</td>
<td>Moderate</td>
<td>Moderate/Major</td>
</tr>
<tr>
<td>Did real estate development fully meet practitioners’ expectations?</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Interstate MAX—Portland, OR**

The Portland, Oregon region, the 23rd most populous metropolitan area in the United States, has been expanding its MAX light rail system (currently 50-miles) steadily since the first line opened in 1986. The Interstate MAX project, a 5.8 mile extension of Portland’s system, was completed in 2004. The line connects downtown Portland to its northern suburbs in the state of Oregon and was designed with an intent to eventually extend the line further north, across the Columbia River, to Vancouver, WA.

The Interstate MAX design was thoroughly influenced by real estate development considerations, though interviewees suggested that the real estate development potential of station areas was never thoroughly analyzed by real estate professionals and they were unaware that any feasibility analyses were conducted. In particular, City of Portland land use planners and staff of the Portland Development Commission (PDC) played significant roles in project planning and focused heavily on real estate development potential around the project. Transit operators had been interested in a freeway-oriented alignment that was less expensive to construct, provided travel time savings, and was anticipated to have higher ridership than a parallel alignment in the median of an arterial. However, expectations that the transit investment would spur significantly more real estate development and economic development if it were constructed along the more costly arterial alignment became the primary justification for its selection.

As of 2012, interviewees suggested that the amount of transit-oriented development around the project’s stations had not met their expectations. They explained that most of the development that had occurred, while exemplary transit-oriented housing, had been subsidized by Portland’s
redevelopment agency and other affordable housing programs such that it could have occurred without a transit investment.

Project description

The Interstate MAX project was a major component of Portland’s long range MAX light rail system plans. Construction of Eastside MAX (part of today’s Blue Line) commenced in 1982, and that line from downtown Portland to Greshman was opened in September 1986 (TriMet 2012a). Building on the initial line’s success, voters approved the Westside MAX (also part of today’s Blue Line service) to Beaverton and Hillsboro in 1990. In 1993, the region’s transit planning focus shifted to the next highest priority, the South/North Transit Corridor, which stretched from the southern suburb of Milwaukie in Clackamas County through Portland and across the Columbia River into Vancouver, WA (Metro 1998). With the completion of South/North, there would have been a north-south and east-west radial system intersecting in downtown Portland. The Interstate MAX project was originally one quarter of the South/North Transit Corridor, the only part constructed in the 2000’s after two failed votes to fund South/North in the 1990’s.

Though a regional bond vote failed in 1998, results showed that 54% of City of Portland voters and 55.1% of Portland residents within ½ mile of the alignment north of downtown supported the bond measure (Office of Transportation 2001). In March of 1999, a group of local business and community leaders—predominantly Downtown stakeholders—asked TriMet to investigate a scaled back alignment on the northern portion of the corridor, from the Rose Quarter to Expo Center. TriMet, Metro, and the City of Portland were able to complete planning and sign an FTA funding contact by September of 2000. TriMet reported the total project cost as $350 million, of which nearly 74% ($257.5 million) was federally funded (TriMet 2012b). The remainder of the project was paid for by the City of Portland, Metro, and TriMet. A critical component of the funding was a $30 million contribution from the City of Portland’s redevelopment agency (PDC). Notably, PDC played a role because the poor market fundamentals and “blight” in part of the corridor qualified the area as a redevelopment district. In total, the line comprised 5.8 miles of bi-directional track and 10 stations. Interstate MAX opened on May 1st, 2004, four months ahead of schedule.

As of 2013, Yellow Line operations were operated on the Interstate MAX infrastructure. The Yellow Line runs from downtown Portland, through North Portland neighborhoods to the Expo Center, near the border with Washington State. The northern terminus had been selected to enable future expansion across the Columbia River to Vancouver, WA per the original South/North project. The southern end of the line initially tied into the original east-west downtown transit alignment on SW Morrison and Yamhill Streets, shared with the Red and Blue Lines. Since 2009, the Yellow Line has utilized the revitalized north-south Portland Transit Mall to travel through downtown Portland to its terminus at Portland State University.

Community planning in the corridor

Subsequent to the passage of a regional rail system plan but prior to the detailed planning of the South/North corridor, neighborhoods surrounding much of Interstate MAX were the subject of a major community planning effort undertaken by the City of Portland. The plan’s area encompassed the Rose Quarter event district, the hospital campuses, and parts of the region’s remaining port district, an area overlapping the historic City of Albina. In the late 1980’s and
early 1990’s, Portland’s Planning Bureau worked with the communities to produce a revitalization plan, the Albina Community Plan, which considered transportation, land use, and other elements. The overarching objective of the plan was to rejuvenate a low-income, minority community that was perceived to have suffered from years of suboptimal public investment. In fact, the area was considered blighted and qualified for redevelopment agency designation as an urban renewal district.

Transit was a focus of the planning process. According to the process’ kick-off documentation, “Staff at the Bureau of Planning will be working closely with the City’s transportation planners to assure that the land use and transportation provisions of the ultimate plan are coordinated with, and support, the light-rail program” (City of Portland Bureau of Planning 1990). In fact, the planning process involved a technical advisory committee comprised of individuals from numerous agencies including the Portland Development Commission and TriMet (City of Portland Bureau of Planning 1993).

The final plan, adopted in 1993, articulated a need to coordinate land use changes with the light rail transit proposed for the South/North corridor. For example, the plan’s policy for transit supportive development stated, “Focus new development at locations along transportation corridors that offer opportunities for transit supportive development and foster the creation of good environments for pedestrians in these areas.” A representative objective of the development policy (one of six objectives) was, “Concentrate new commercial investment in areas which are well served by transit” (City of Portland Bureau of Planning 1993, 24) Reflecting the cross-cutting transportation and land use elements of the plan, one objective identified under the plan’s transportation policy was, “Concentrate new residential developments and commercial investment near transit corridors” (City of Portland Bureau of Planning 1993, 31).

Most importantly for the planning of Interstate MAX, while the plan recognized that two routes—one along Interstate Avenue and one along I-5—were under consideration by Metro and TriMet and called for transit supportive land use densification around future transit stops, the plan’s policies also called for densification to occur in existing commercial nodes on major commercial corridors. This meant that the plan was to be transit supportive if the light rail were to be built along the Interstate Avenue corridor rather than the I-5 alternative. Interviewees suggested that the plan resonated with transit planners and it was ultimately considered by both Metro and TriMet to be the final word on the community’s land use, economic development, and light rail desires.

**Planning South/North**

Besides advocating for a particular transit alignment, it was also suggested by one local transportation planner that the proposed zoning changes and development potential discussed during the early phases of the Albina Community Plan helped justify pursuing the South/North transit project over others on the region’s long list of projects, projects that were also vying to be the next major investment. Though it would have been logical for planners to concentrate on the primary north-south corridor after completing planning for the region’s major east-west light rail spine in the early 1990’s whatever the land use planning situation, during the Albina Community Planning process, South/North did become the next project to enter into the planning phases.

The primary agencies involved in the planning of both South/North and Interstate MAX were Metro, Portland’s unique elected regional government; TriMet, the regional transit agency covering Multnomah, Clackamas and Washington counties; and the City of Portland. Metro
developed the light rail system plans. The City of Portland’s Planning Bureau conducted a major revitalization plan for the area surrounding the future project, the Albina Community Plan, and the Portland Department of Transportation coordinated with Metro and TriMet as the project was designed in street right-of-ways. Metro and TriMet worked together, with Metro as lead agency, to prepare environmental documents, develop initial design documents, and secure funding from the FTA. TriMet managed the project design and project construction.

As noted above, the plans for Interstate MAX arose out of those developed for the South/North corridor. North of downtown Portland, where today’s Interstate MAX project has been built, the proposed South/North light rail corridor exited downtown’s transit mall to pass through the Rose Quarter event district, served several hospital campuses, skirted one of the region’s remaining port and industrial districts, served the City of Portland’s Exposition Center near the Columbia River, and passed over the Columbia River to reach downtown Vancouver, WA—a fast growing, northern suburb of Portland. The connection of these major destinations defined the South/North route, although Interstate MAX would only be built to the Expo Center without reaching the Columbia River crossing. As one transit planner explained, early considerations for South/North station locations focused on serving the major centers and also aligning transfer points for bus patrons on cross-town routes along major east-west thoroughfares.

**Figure 3 – “Segment 8: Kaiser to Expo Center”**

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*Image credit: Oregon Metro (Metro 1995, 53)*

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17 Image credit: Oregon Metro (Metro 1995, 53)
Throughout the planning of the South/North corridor, two possible alignments were considered for the segment of the light rail from the Kaiser Hospital campus, north of downtown Portland, to the border with Vancouver, WA (see figure above). These alignments were called “Interstate Avenue” and “I-5” because one alignment would run down the center line of Interstate Avenue for much of the way (a four-lane state route that served as the primary north-south traffic artery prior to the opening of Interstate-5) and the other route would parallel Interstate-5 in right of way along the west side of the interstate. According to early plans, an equal number of stations were to be located along the two routes and the stations were proposed at the same cross streets along the route.

As of 1994 evaluations of the North Portland section of the South/North project, comparative characteristics of the two Interstate alternatives suggested that the I-5 alignment would have been cheaper, been faster, had more ridership, and produced fewer nuisance impacts on the neighborhood than the Interstate Avenue alignment. From this, one can extrapolate that the differences between the Interstate Avenue and I-5 alignments were very significant for Interstate MAX, a significantly smaller project than the South/North had been. As can be seen in the table below, one could extrapolate that the Interstate Avenue option added 50% additional costs over the I-5 option on the smaller Interstate MAX project. The Interstate Avenue alternative would have also had 15% fewer riders.

Table 12 – Summary characteristics of proposed South/North arterial and freeway alignments extrapolated to the Interstate MAX project that was built

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Interstate Avenue</th>
<th>I-5</th>
<th>Projected differences between South/North I-Ave and I-5 alignment options (1994)</th>
<th>Extrapolated differences between Interstate MAX’s built I-Ave and unbuilt I-5 options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of Expenditure Cost (millions)</td>
<td>$1,199</td>
<td>$1,085</td>
<td>I-Ave = $114 more expensive</td>
<td>I-Ave = 52% more expensive</td>
</tr>
<tr>
<td>LRT Weekday Ridership from Oregon City to 179th</td>
<td>64,000</td>
<td>65,400</td>
<td>I-Ave = 1,400 fewer riders</td>
<td>I-Ave = 15% fewer riders</td>
</tr>
<tr>
<td>Total Weekday Corridor Transit Ridership</td>
<td>131,350</td>
<td>132,800</td>
<td>I-Ave = 450 fewer riders</td>
<td>I-Ave = 5% fewer riders</td>
</tr>
<tr>
<td>Effective LRT Operating Cost (millions) from Oregon City to 179th</td>
<td>$18.14</td>
<td>$18.02</td>
<td>I-Ave = 0.7% more expensive</td>
<td>I-Ave = 0.7% more expensive</td>
</tr>
<tr>
<td>Cost Effectiveness Ratio (lower is better)</td>
<td>8.36</td>
<td>7.94</td>
<td>I-Ave = 5.0% less cost effective</td>
<td>I-Ave = significantly less cost effective</td>
</tr>
<tr>
<td>Residential and Business Displacements</td>
<td>40/65/120</td>
<td>70</td>
<td>I-Ave = fewer displacements in most cases</td>
<td>I-Ave = 70 fewer displacements (no direct displacement)</td>
</tr>
</tbody>
</table>

According to South/North planning documents, there were significantly more advantages related to the I-5 proposal when compared to the Interstate Avenue alternative (Project Management Group 1994a, 19). Planners thought the I-5 alignment would provide better access to the Portland Community College (PCC) campus on N.E. Killingsworth and neighborhoods east of Interstate-5

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18 Table reflects forecasts from the middle stages of South/North project planning (Project Management Group 1994a, 18–19).
19 Interstate Avenue variations reflect different roadway designs to accommodate varied levels of automobile capacity.
while providing excellent accessibility to the prospective high density development between Interstate Avenue and Interstate-5 that was identified during the City’s Albina Community Plan process. Operating noise impact would have also been minimal along the I-5 alignment because noise walls would have been installed along the route. The walls would have also provided sound protection from Interstate-5 traffic noise and been an additional benefit for the community. The alignment would have provided nearly equal accessibility benefits for new dense developments considered within the Albina Community Plan while providing greater accessibility to residential areas west of Interstate Avenue. South/North planning documents suggested that the Interstate Avenue alternative was only superior to the I-5 alternative in terms of the number of residential and business displacements and the prospective station area real estate development and economic development impacts that were expected to arise because Interstate Avenue operations would have provided more rail visibility and more direct access to properties along Interstate Avenue.

Yet, many transit planners, community advocates, and local government staff preferred the Interstate Avenue alternative due to its potential for community redevelopment. As a planner explained, “The [North Portland] residents saw the value of transit and [attendant] reinvestment [to] re-create a neighborhood that was lost because of the freeway [construction].” Community members and City of Portland planners were convinced that the development potential would be maximized if the rail ran along the Interstate Avenue corridor rather than the freeway right of way just a few hundred feet further east.

At one point, Metro’s Project Management Group suggested that a modified alternative be studied, one that merged the two concepts by utilizing the Interstate-5 right of way between stations and then diverting the line several blocks so that station platforms would be located on Interstate Avenue in support of local development plans (Project Management Group 1994b). According to a regional planner, transit planners considered several hybrid variations of the alignment. However, the operational benefits were considered much too small relative to the number of property takings that would have occurred.

A City of Portland planner explained that the Albina Community Plan and the development it envisioned was potent rhetoric for the Interstate Avenue alignment. “Commissioner Earl Blumenauer, now Congressman Blumenauer, said, ‘This is our agenda. Part of that community process was to look at transit, especially light rail, and build communities around stations.’” A transit planner suggested that the debate was all but settled based on the real estate development expectations but the I-5 alternative had to be studied during the federal environmental review process. In fact, the final Draft Environmental Impact Statement (DEIS) included both alternatives and suggested that the two alignments presented a tradeoff between costs and enhancing certain “land use opportunities” (Project Management Group 1996, 32).

By 1995, the Interstate Avenue and I-5 options were viewed largely through the lens of the inevitable revitalization that would accompany the rail investment, a view that all interviewees said strongly favored the Interstate Avenue alignment. Stations were considered to be highly influential on development outcomes, with their effects degrading the further one moved from the station. Several interviewees described how access to a rail transit station, not access generated by a transit services, was predictive of real estate development. One transit planner suggested that the walk shed of a transit station determined where development might occur and pointed out that the Interstate-5 corridor acted as a barrier to reduce the overall area that would have been influenced by either the Interstate Avenue or I-5 options.
Along another part of the line, similar sentiments led to concerns about the placement of a station within an existing industrial district. Considering the stretch of the project where it left downtown and proceeded north, up to the point where it would either follow Interstate Avenue or I-5, planners had decided to focus on two alternatives close to Interstate-5. South/North environmental planning documents did not include the alternative that was ultimately built as part of the Interstate MAX project. Rather than proceed through dense areas alongside Interstate-5, the built alternative followed the curve of the Willamette River through an industrial area. The official reason that the built alternative was not included in studies was because any station in that area would have been located in a zone designated by the City of Portland Bureau of Planning for continued urban industrial uses. Due to the perceived inevitability of real estate development around transit stations, it was feared that a station would have produced “non-industrial redevelopment pressures which contradict City objectives for this area” (Project Management Group 1996, 27). It was anticipated that transit-oriented development would displace existing industrial uses within a half-mile of any station.

**Planning Interstate MAX after South/North**

The South/North decision-making process was profoundly informed by real estate development considerations. In fact, once voters rejected the second funding measure in 1998 and a revised alternative was considered, it reopened debate and even greater consideration was given to station area real estate development. Several transit planners explained that it was at that point that they found themselves pushing back against some real estate development-related design elements based on the implications for transit operations.

The Planning Department leaned heavily on the Albina Community Plan process as they considered options for a truncated South/North route. A transit planner explained that they argued that the Interstate Avenue alignment would put stations in Smart Growth locations, the only places that could support the type of development highlighted in the Ablina Community Plan. Going a step further, one planner explained that the City saw an opportunity to revise the transit plans to bring about more economic development by proposing more stations than originally conceived. City planners argued to Metro and TriMet that more stations would be viable along Interstate Avenue since travel times from Vancouver, Washington would not need to be a major consideration for the truncated route. In fact, one transit planner recalled that City Transportation staff argued that having more stations in Portland would slow travel times and reduce the benefits to outlying areas like Vancouver if an extension ever did take place. Thus, the region’s Smart Growth goals would be better met. However, transit planners sought to preserve the option for relatively fast light rail service to Vancouver and argued against the proposed station additions. In spite of the disagreements about the transportation costs and benefits, the conversations highlighted the consensus that existed amongst stakeholders that transit stations would spur new real estate development and private investment in the corridor.

The Portland Development Commission (PDC), manager of the local government’s tax increment financing (TIF) capacity, became a central figure in the transit planning discussion. A transit planner explained that without the bond approval, transit stakeholders searched for funding sources and PDC was lobbied to allocate tens of millions of its North Portland redevelopment area dollars to the truncated transit project. Debates ensued. A PDC planner recalled debates over the reallocation of PDC funds from workforce training programs and other economic development initiatives to the rail project. The conversation also reopened discussions about the possibility of expanding bus services to the area rather than expanding the light rail
system. Yet, PDC planners were convinced by transit project stakeholders to make the investment in rail transit.

A PDC planner explained that PDC had long been invested in bringing the Ablina Plan to fruition and had become advocates for the rail project because transit system planners and regional land use planners had convinced the agency of rail stations’ transformative potential. The PDC’s funding came from property tax increments and when the PDC was asked to help fund the project, the organization’s staff reaffirmed their commitment to the Interstate Avenue alignment because there were greater prospective property value impacts if stations were located closer to sites designated for development. PDC staff hoped the Interstate Avenue would generate additional increment that could fund other initiatives like job training.

Further, PDC staff hoped that the real estate development that was inevitable around the MAX stations could be shaped to meet community needs and avoid negative impacts. A PDC staffer recalled engaging in frequent discussions where community members expressed fears like, “We’re going to have 16-story apartment buildings overlooking our yards and no parking.” The organization’s staff worked to assure the community that public policies were in place to retrain the development pressures that would emerge once the transit project was built.

In particular, PDC engaged with the communities to discuss where the stations could be located to maximize politically acceptable development opportunities and, in turn, the tax increment funding that could be generated for other economic development programs. Though some station locations were considered obvious and fixed, several were considered debatable. As one PDC staffer explained, “[This was taking place] in the neighborhoods that have historically not trusted city hall and so being able to debate where stations went was actually a huge community debate.” PDC also engaged stakeholders in discussions about what type of development would be desirable. “The single family neighborhoods, the Overlooks and Arbor Glen, were trying to decide which one would allow a commercial node without threatening the single family character of their neighborhood.”

This actually contributed to a self-referential reaffirmation of the consensus that the Interstate Avenue alignment was going to generate more real estate development than the I-5 alignment. A transit planner explained that Metro and TriMet appreciated the PDC’s commitment to Interstate Avenue as confirmation of the real estate development potential by an organization steeped in real estate investing. As one transit system planner explained, “A lot of different people were saying, ‘Why are you investing in [the Interstate Avenue project]?’ The PDC invested $30 million. We’re going to listen!”

Ultimately, any debate over the I-5 and Interstate Avenue alignments were put to bed when Mayor Katz vowed that no businesses would close—a rhetorical focus for project detractors—and predicated the PDC’s investment on proceeding with the Interstate Avenue alignment. A City Planning staffer recalls the Mayor stating, “No condemnations. We’re just going to work with the community and figure out what our development opportunities are and how to best use the [redevelopment agency’s] money except for the $30 million for rail.”

The City’s planning departments, both transportation and land use planning staff, worked with the PDC to promote the project and to help overcome any opposition to spending part of the redevelopment funds on the project. As one city planner explained, the outreach for the transit project was focused on general public approval and station area real estate development.
“The process itself was pretty involved in terms of getting community meetings, community blocks, one-on-one contacts, meeting with property owners, meeting with developers, getting people engaged, getting people all excited. So looking forward towards that investment, recognizing that there's going to be a construction period but there is something very positive at the end and trying to get that synergy focused on not just to invest on that rail project but also get property owners and developers motivated.”

**Real estate development outcomes**

In spite of some difficult tradeoffs made during the planning process, all of my interviewees believed that the Interstate MAX project was a success. However, interviewees suggested that land use impacts had not met expectations. In fact, in a retrospective evaluation of the project’s performance, the Federal Transit Administration (2008) explained discrepancies between projected and actual ridership figures based on the fact that transit planners calibrated their ridership models with land use projections that did not materialize.

When asked what they might do differently to make the project more successful, two interviewees believed that more could have been done to capitalize on the project through proactive land use planning. The Albina plan was approved more than a decade before the project opened and planners thought more updated land use planning would have generated more real estate development. Whereas several previous transit projects had included funds for locals to conduct station area land use planning, there was no money allocated to land use planning within the limited Interstate MAX budget and older plans and policies were maintained.

Another regional planner argued that the project had been successful. He argued that the station planning process coalesced neighborhoods—communities previously very distrustful of city hall—around a public investment. He argued that the PDC has helped spur real estate development through grants to affordable housing projects in the corridor. He also argued that Portland’s Department of Transportation changed the local road system to accommodate pedestrians and bikes, which has attracted community investment. However, he was not able to say that the land use impacts anticipated in plans and articulated by planners had occurred.

In fact, a City of Portland staff person shared the sentiment that all of the ancillary investments associated with the light rail project have made the community better. However, he acknowledged that the rail itself may have had little influence on land use. He pointed to several projects that were built with considerable financial support from PDC and a few projects that may have been designed to be more pedestrian oriented. While he thought the light rail stations and the light rail “brand” might attract more investment consideration along the corridor than would have existed with the old bus service, he suggested that transit “may or may not have made a big difference” for the projects that were built. In fact, he thought the $30 million in tax increment dedicated to the rail budget might have been able to spur more development in the area had it been spent on more targeted planning and project subsidies rather than light rail.

In this instance, the potential for real estate development outweighed several “classic” quantitative metrics used by transit planners to assess alternatives. A major portion of the Interstate MAX project was forecasted to be more expensive, operate more slowly, attract lower ridership, and have more nuisance impacts on neighborhoods than the alternative under serious consideration during planning phases of the project. Yet it was constructed because of the prospective real estate development that was expected by transit planners, land use planners, community members, government officials, and others. There was a consensus in Portland, a
region known for its Smart Growth planning, that transit investments would impact land use. Due to the consensus regarding the Interstate MAX’s transformative potential, little empirical analysis was ever done to demonstrate that real estate development would be feasible in the area. Ultimately, an ex-post criticism of the project was that it did not generate the real estate impacts touted by local planners and expected by federal funders. It is not clear that the realized real estate development benefits of the project have justified the higher capital costs that were incurred to promote transit-oriented development.

**North Central DART LRT—Dallas, TX**

The North Central Corridor, completed in 2002, is a rail extension of the original DART light rail starter system that opened in 1996. The 13.8-mile Red Line extension was located in a former Southern Pacific rail corridor paralleling north-south U.S. Highway 75, known locally as the North Central Expressway. The light rail corridor passed through the cities of Dallas and Richardson, terminating in the City of Plano. The project consisted of nine new stations and the reconstruction of Park Lane Station, the former terminus of the Red Line.

The North Central Corridor was conceived of and implemented as a release valve in highly congested, auto-oriented location. While the transit planning process focused on automobile congestion on parallel routes, park and ride stalls, and other auto-related criteria, some design changes were motivated by real estate development considerations. Local governments’ enthusiasm for the proposed North Central project peaked when several significant real estate investments were made at stations on the operating segment of the Red Line. The City of Richardson developed land use plans that described dense mixed-use districts around two proposed stations while the City of Plano sought to add a station to the alignment to support downtown rejuvenation efforts. Transit planners looked to the city’s plans to determine how much real estate development to expect and expended resources to modify the project based on those expectations.

Transit-oriented development was built at two of the stations, though transit planners suggested it had not occurred to the extent that had justified transit project changes. They did expect that the development would occur eventually and, irrespective of the time between the expenditures and the corresponding benefits, would prove their efforts worthwhile. This case study demonstrates how real estate development considerations can influence transit project planning even in auto-centric environments and transit project modifications do not always result in anticipated transit-oriented development.

**Project description**

In the early 1980’s, the Dallas region adopted a rail plan and established the Dallas Area Rapid Transit Authority (DART) (Dallas Area Rapid Transit 2012; Dallas Area Rapid Transit 1982). By 1984, DART was operating commuter-oriented, non-stop express bus service from Plano and Richardson in the fast-growing northern Dallas suburbs to downtown Dallas. The earliest rail plans included the North Central Corridor from downtown Dallas to Plano (Dallas Area Rapid Transit 2012). In April 1988, DART purchased 34.5 miles of railroad right-of-way from the Southern Pacific Transportation Company, including the rails paralleling the North Central Expressway that would become the North Central Corridor (Dallas Area Rapid Transit 2012). A planner described the North Central Corridor as the most cost effective investment in the plan, so
much so that it might have been able to exist as a successful stand-alone rail investment with no other transit network, bus or rail.

The systems’ planners phased transit implementation. They constructed DART’s express bus park-and-ride facilities at proposed rail station sites so that some North Central Corridor infrastructure would be built in advance. In 1991, the Richardson Transit Center opened for bus park-and-ride and bus transfer operations (Dallas Area Rapid Transit 2012). It became the Arapaho Center Station. In 1992, the East Plano Transit Center opened just north of downtown Plano. It became Parker Road Station, the terminus station of the North Central Red Line. Reflecting the congestion-oriented nature of DART’s mission, DART’s bus facilities were also aligned with DART-funded HOV lanes on US-75 and other major Dallas freeways.

By 1992, DART had broken ground on its light rail “starter system” and began the official federal planning process for the North Central Corridor (Dallas Area Rapid Transit 2012). A transit planner explained that while the North Central Corridor was projected to be the best investment, politics dictated that southern routes be built first to serve the transit dependent population in south Dallas. Thus, North Central became the first extension of the original system with construction commencing in 1999 (Dallas Area Rapid Transit 2006; Federal Transit Administration 2000). The North Central Corridor extension opened in two phases, both in 2002 (Dallas Area Rapid Transit 2012).

Upon opening in 2002, Red Line service operated from the northern Dallas suburbs to Westmoreland in the southeastern Dallas suburbs (Dallas Area Rapid Transit 2012). In 2009, with the opening of the first Green Line stations, Orange Line service began to share Red Line tracks along the North Central Corridor but split off from the Red Line in downtown Dallas to serve stations on Green Line tracks to northwest of downtown.

As of 1996, DART estimated that over 11,000 daily riders would use the North Central Corridor extension in the year 2010 (Federal Transit Administration 1996a). Subsequent estimates suggested that there would be 17,000 riders in the year 2010 (Federal Transit Administration 1998). In reality, approximately 11,000 weekday riders boarded at the nine stations of the North Central Corridor extension in 2010. Also, approximately 18% of total LRT system ridership boarded along the North Central Line (which represented 23% of the system’s stations) (Dallas Area Rapid Transit 2012).

Planning the North Central Corridor

The North Central Corridor was part of a much larger transit system envisioned by NCTCOG, UMTA, and DART in the early 1980’s. At the time, UMTA’s funding criteria put significant emphasis on executing low-cost, high-ridership projects in congested corridors, which led to the prioritization of the North Central Corridor investment (Dallas Area Rapid Transit 1991). Notably, the criteria put little or no emphasis on land use planning or real estate development.

Because automobile congestion was a major impetus for the transit project, several system planners suggested they focused on providing a competitive alternative in terms of travel time. According to several transit planners, they “knew it would be successful from a ridership standpoint” because it would connect park-and-ride facilities near fast-growing suburbs with downtown Dallas. At the time, one transit planner had argued that the North Central would support continued growth of employment in the corridor. In particular, transit planners touted the possibility of reaching technical jobs within a growing telecom cluster north of Dallas.
In spite of this, several project planners explained that DART’s planning staff considered the line a park and ride-accessed facility for downtown office workers. The station locations were set in the very earliest plans based largely on where the line intersected with major east-west arterial roadways and where physical geometries allowed for long linear station platforms. Secondarily, planners considered the availability of low cost land that could be procured for station access infrastructure. Such locations were typically underutilized strip commercial or light industrial uses that had once relied upon or co-existed with freight rail operations. Opportunities for real estate development were only marginally considered. They were, for the most part, not influential in the initial designs of the facility.

In fact, as part of the pilot program for the real estate development-related New Starts evaluations, the North Central Corridor received the second worst rating among 11 pilot projects (Bass and Dunphy 1998). One FTA staff person suggested that it would have been very unexpected for a “mobility-focused” project like the North Central Corridor to have any appreciation of real estate development whereas other “economic development-focused” projects might.

**Local land use planning and the transit project’s design**

In spite of a lack of focus on real estate development in the early phases of project planning, local plans and the real estate development envisioned in them inspired several modifications to the project’s design in the later planning phases. In three noteworthy instances, DART modified transit plans based on real estate development considerations. The City of Plano and the City of Richardson watched as development occurred around other DART light rail stations in the City of Dallas. Inspired, they worked with DART planners to make modifications to the North Central Corridor’s plans that would support transit-oriented development in their jurisdictions. Fully expecting the development described in plans would come to pass, transit planners made design adjustments.

In one case, a transit planner explained that the City of Plano worked with DART to build a station in downtown Plano to help spur economic development. The tracks passed through the downtown and were the historic reason for downtown’s location. Though comfortable hosting the major park-and-ride facility north of their downtown, City officials were reluctant to provide any additional stations where transit patrons could access the downtown. The City of Plano was undertaking a concerted effort to rejuvenate the downtown and had been carefully cultivating the types of events and businesses in the vicinity. Hedging, City staff suggested DART build a station platform that could have been used for special events. The station location they suggested would have required the demolition of an antique mall considered a blighting influence.

In the mid-1990’s, just as planners at DART suggested that they began “working on TOD,” the City of Plano achieved some early successes rejuvenating the downtown. The antique mall was replaced with a skate park that attracted families to downtown. Additionally, development plans were being proposed around stations of the newly opened light rail system—particularly Mockingbird Station further south on the Red Line. Hoping to capitalize on renewed interest in Plano’s downtown and development trends they saw elsewhere, the City of Plano’s staff and council members suggested that DART consider placing the station just a few hundred feet north of the initial location and making it a full-service facility.

As a DART member jurisdiction, Plano had a seat at the decision making table and Plano’s Mayor leveraged that influence to work directly with DART transit planners to design the new
facility. Ultimately, based primarily on political pressure and the economic development that the City and transit planners considered eminent, DART added the station to the plans in spite of the fact it was anticipated to generate only 400 riders per day, the least riders of any station on the line. The City helped develop a large apartment complex adjacent to the station, improved nearby streetscapes and parks, and spearheaded a major reinvestment in commercial storefronts. Though it was the station with the lowest ridership on the line, the station actually exceeded ridership expectations by 33%. As a DART planner explained, though there had been high hopes for the real estate development in the area, it was still considered a success by all parties involved (Dallas Area Rapid Transit 2006; Dallas Area Rapid Transit 2012). From his perspective, he had pleased a DART member jurisdiction, which could not be quantified and compared to the capital cost of the Plano Station.

In another case, officials from the City of Richardson pursued a transit station in support of their plan to develop a major employment center near US-75. During the early stages of the transit planning process, a station at Campbell Road had been deferred by transit planners because of low ridership estimates. However, City officials encouraged DART to reconsider the deferral and the location of the station. They proposed that it be moved one mile north along the right-of-way to coincide with a new DART-funded freeway exit from US-75 onto Galatyn Parkway that was the primary impetus for the development of a dense multi-use district in the city. Near the Galatyn Parkway highway exit and the Galatyn Park light rail station, Richardson land use planners proposed a hotel, a performing arts center, numerous office complexes, and several apartment complexes for the area.

One regional planner considered Galatyn Park to be the foremost example of transit-oriented development planning in the region and, at the time it was proposed, the regional government was very supportive of the station relocation. As a DART transit planner explained, Richardson’s land use plans were considered dense enough to merit a transit station and the City was willing to construct a plaza and other new pedestrian infrastructure to connect the station to the planned developments. Given DART’s involvement in the highway interchange—along with other funders—Richardson officials were easily able to convince DART to make the additional transit investment to support the area’s development. With real estate development proposals proceeding through the permitting process in parallel with the transit project’s construction, the transit planners were ever more confident that the land use plans and policies would deliver the development that was envisioned soon after the North Central Corridor opened. In fact, several real estate projects did open soon after rail transit service began. However, much of the development identified in the original plans has yet to come to fruition and large vacant development sites, open fields bisected by roadways and sidewalks, dot the landscape around the station. A transit planner suggested that Richardson’s planners had failed to fully capture the momentum generated by the transit investment and, without the possibility of another transit investment to spur development, did not know when the land use plans would be fully realized.

In another instance, the City of Richardson also urged DART to reposition a park-and-ride station at the President George Bush Turnpike, then State Highway 190, to support real estate development. To provide a shaded environment, the station’s park-and-ride facility was designed as a series of surface parking lots between piers of the elevated highway structure. Rather than locating the station under the highway or north of the highway—near an existing office industrial park—Richardson convinced DART to locate the station several hundred yards south of the park-and-ride lots to promote real estate development. The station platform, in the middle of a
field with a nearby creek and surrounded by a smattering of woods, can be seen in the image below.

Figure 4 - Bush Turnpike Station West near the US-75 and President George Bush Turnpike interchange, Richardson, TX

Based on early sketch plans for development on the one quarter of a square mile site, transit planners were convinced that significant and transit supportive development would be built if they improved access to the site. The greenfield property was under consolidated ownership and the City of Richardson was working with owners to plan for development. Transit planners could not recall any mention of the economic feasibility of the proposed developments. Rather, they focused on the physical descriptions of the envisioned developments.

The landowners were willing to dedicate some of their land for the station’s platforms and bus transfer facility so that automobile access would be increased to one half of their landholdings. The property was hemmed in on the north by the Turnpike and the west by US-75. The railroad passed down the middle of the site at a diagonal, rendering part of the site very difficult to access. In addition to providing automobile access, Richardson officials and DART planners

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believed that moving the station closer to the center of the site—further from the park-and-ride stalls—would make more of the parcel attractive for development by giving more of the site close access to the station.

However, as can be seen in the 2013 satellite image above, development has yet to occur on the site. In fact, it has been discussed that plans for an east-west rail alignment may be modified to bring the rails through the same site to help spur the development that had been envisioned in the 1990’s and inspired the infrastructure designs seen today.

Real estate development outcomes

Without exception, interviewees considered the North Central a great success. In spite of ridership that has underperformed relative to projections, regional planners and transit planners believe it has mitigated some level of highway congestion and, thus, helped the region avoid detrimental impacts to its overall economic development. However, the line itself has failed to generate the real estate development impacts that were expected. The difference in the project’s projected and actual ridership has been primarily attributed to reduced DART service levels and secondarily to a lack of real estate development around the corridor (Dallas Area Rapid Transit 2006). An ex post evaluation of the investment found, “The total efficiency and effectiveness of the LRT system is impacted by numerous factors outside the control of DART, such as economic conditions and developments and construction near station sites” (Dallas Area Rapid Transit 2006, 110).

Transit planners adapted the project to promote real estate at some cost. While they had a difficult time defining the hard costs associated with the design modifications, planners were quick to point out that some of the hard costs associated with the changes were avoided through the donation of right-of-way. Still, the changes required the expenditure of time and money and impacted transit operations. Park-and-ride users were required to walk long distances to access the Bush Turnpike Station and all riders passing through the two additional infill stations suffered travel time impacts if their destinations were elsewhere on the line.

In spite of the modifications to the project’s design that were intended to support development, transit-oriented development has not materialized to the extent anticipated. A transit system planner attributed the lack of real estate development around some stations to local communities’ familiarity with transit.

“A lot of the economic development [around Red Line stations] is occurring in areas that do have a history of transit service in the past, so that the community understands the benefits of the transit service. So when you do get the rail system in there, it doesn’t take long for the economic development to occur with very little public sector encouragement. The Mockingbird station in Dallas didn’t have to have a lot of city of Dallas incentives; some, but not near as much effort as the city of Dallas for Mockingbird station as you have up in Plano and Richardson at their stations. Those local governments had to spend a lot of effort to eventually get the economic development just started there.”

Other planners suggested that it was just a matter of time before real estate development occurred in several underutilized areas around the rail line. In spite of the evidence thus far, several transit planners expected that real estate transformations matching visions described in local land use plans would occur eventually. They believed the anticipated development would prove their efforts to be worthwhile.
The North Central Corridor case study illustrates how transit planning processes and project designs can be influenced by real estate development even when it is a relatively marginal consideration for a congestion mitigation-focused transit project. In this instance, expectations for transit-oriented development were defined by local land use plans and inspired changes to three of the projects nine stations. The case study also reaffirms what was found in the Portland case study above, real estate development-inspired transit project elements do not always yield the transit-oriented development that was expected.

LYNX South Corridor—Charlotte, NC

The South Corridor, now called the LYNX Blue Line, is a 9.6-mile, 15-station light rail project extending south from Uptown Charlotte, North Carolina (the city’s central business district) to Interstate-485 in southern Mecklenburg County near the South Carolina State border. The facility, completed in 2007, generally parallels north-south Interstate-77 and serves considerable commuter traffic accessing the 80,000 jobs located in Charlotte’s CBD. The South Corridor case study suggests that transit project planners can focus heavily on Smart Growth urban development goals and expend considerable resources adapting project designs to successfully promote station area real estate development in many, but not all, instances.

The project may reflect what Knight and Trygg (1977b) suggested in their report: development is most likely to occur around transit stations when transit investments are aligned with locations where development was likely to occur irrespective of the transit investment or where a transit investment can produce the political will to address existing impediments to real estate development that would otherwise occur. Invariably, interviewees suggested that transit-oriented development projects along the line would have happened regardless of the transit investment. A transit planner explained, “The market was so strong at the time, [the projects were] bound to happen.” That said, in some instances, zoning relaxation and infrastructure investments that were motivated by the transit investment were identified as critical factors that allowed transit-oriented development to occur at the scale that it did.

Real estate development around many of the project’s stations has met the expectations of planners. However, several transit-oriented development opportunities that planners expected to happen leading up to or following soon after the Blue Line’s service commenced have not come to fruition. Planners attributed any shortfall in development to the nationwide economic slump that occurred just a few years after the project opened. Even so, real estate development that was expected to occur well before the economic crisis has still not come to fruition near one signature transit infrastructure design feature implemented to promote real estate investment.

Project description

Rail transit planning was initiated in Charlotte in the 1980’s and culminated in the ‘Transit Corridor System Planning Study’ of 1989 (Charlotte Area Transit System and Federal Transit Administration 2002). By 1994, the ‘Charlotte Transitional Analysis’ had identified rail transit corridors that would support the region’s overall land use vision and the ‘Centers and Corridors Concept Plan’ was adopted by the Charlotte-Mecklenburg Planning Commission. Considered by several interviewees to be a model of Smart Growth regional planning, the integrated land use, economic development, and transportation plan identified five radial corridors of dense urban development along parallel roadways and rapid transit lines with wedges of low density single-family housing in between.
Rail transit began to operate along the southern corridor soon after the plans were developed. A transit planner explained that in 1997, the City purchased a 3.3-mile segment of abandoned Norfolk Southern Railroad right of way south of Uptown Charlotte. The City helped build and operate a historic trolley over two miles of the tracks between downtown and several emerging pockets of redeveloped warehouses in Charlotte’s Historic South End (Charlotte Trolley 2012). The trolley was associated with considerable investment in new restaurant and entertainment businesses and the conversion of numerous industrial buildings to new uses. One city planner suggested that, “It was a Disney-like ride but it got the imagination going, and property owners were very enthusiastic about expanding the transit operations.” All along, the trolley was intended to serve as a capital “down payment” on eventual light rail transit services.

In 1998, Mecklenburg County residents voted for a ½ cent sales tax measure that was dedicated to implementing the region’s integrated transportation and land use plan’ (Charlotte Area Transit System and Federal Transit Administration 2003). Soon after, planning began for light rail transit along the much longer South Corridor segment of that same Norfolk Southern Railroad right of way, part of which included the trolley system. By 2005, nearly $200 million in federal funds were committed to the $426.85 million project, with the majority of funds coming from state and local sources (Federal Transit Administration 2005). In addition to and separate from the project budget, the City of Charlotte provided $72 million in complementary infrastructure improvements as part of the South Corridor Infrastructure Program (SCIP) (Charlotte Area Transit System 2012). The South Corridor project, called the LYNX Blue Line, opened for revenue service in November 2007.

The South Corridor’s northern terminus is at the intermodal Charlotte Transportation Center (CTC) in the heart of Uptown Charlotte, which houses approximately 80,000 jobs and 15,000 residents (Charlotte Center City Partners 2012). Major central city destinations include Charlotte’s convention center and two major league sports arenas. The route heads south from there through the mixed-use South End neighborhood and parallels South Boulevard (NC 521) and Interstate-77 until it reaches its terminus at a park and ride station near Interstate-485, roughly three miles from the South Carolina border. Upon the start of rail service, the region’s southern bus routes were re-routed as rail feeders rather than radially focused on the CBD.

In its first few months of operation, the Blue Line averaged between 12,000 and 17,000 weekday riders (Charlotte Area Transit System 2012). Ridership grew steadily, peaking at 21,700 in the fourth quarter of 2008 (American Public Transportation Association 2009). However, in the years since, ridership dropped to a consistent average weekday estimate of approximately 15,000 boardings (Charlotte Area Transit System 2012). Fluctuations in ridership were attributed to the 2008 peak in gas prices and bus service cuts due to declining sales tax receipts during the recession. Actual ridership in 2009 exceeded the projected 2010 ridership estimates by approximately 2,800 trips and this was attributed to the fact that transportation models underestimated the number of riders that would travel long distances to ride the line for relatively short rail trips (Charlotte Area Transit System 2012).

Integrated regional land use and transportation planning

The South Corridor concept emerged from the region’s integrated land use and transportation planning process. Project planners explained that emerging from the ‘Centers and Corridors’ planning process, the community generally agreed to direct growth along future transit lines. As one transit planner noted, “The driver that started the Charlotte Transit program was really
community’s vision for how they wanted to develop as a city.” Per another transit professional, the regional plans would direct growth and transit-served areas would accommodate it in an acceptable way. “The idea was to [use the] transit system to help create an environment for higher density, pedestrian-friendly, mixed use, so-called transit-oriented or transit-supportive land use.” The region’s Smart Growth strategy would allow for growth in the transit-served corridors while minimizing traffic impacts and maintaining the suburban single family neighborhoods that defined much of Charlotte.

The South Corridor was the best option to implement the vision. As several interviewees shared with me, the Charlotte City Council selected the South Corridor to be Charlotte’s first rail investment over the four other corridor options identified in the ‘Centers and Corridors Concept Plan’ in the 1990’s for three primary reasons: the corridor was parallel to heavily congested Interstate-77 in the fastest growing corridor in the region; the corridor coincided with available Norfolk Southern right of way; and there was tremendous potential for redevelopment along the corridor that was fitting with the region’s long range land use vision.

The South Corridor connected fast growing locations in Charlotte. During the 1990’s, the second largest U.S. banking center established itself in Charlotte’s downtown, one of the fastest growing cities in the nation in one of the nation’s fastest growing regions at the time (Charlotte Area Transit System and Federal Transit Administration 2003). A transit system planner explained that much of the region’s housing and commercial development in the 1980’s and 1990’s occurred between the Interstate-77 corridor and the Independence Boulevard corridor, which proceeds radially southeast out of downtown Charlotte. High-end shopping malls were expanded in the quadrant, high-end housing was built within the belt loop, and sprawl continued to spread further south into South Carolina. Significant growth had not occurred in other parts of the region at that time. As one transit professional put it, “There was momentum to the South.”

With growth came congestion. A local planner explained that the South Corridor project was most often framed in community meetings as a release valve for growing traffic as more and more households moved to northern South Carolina and workers commuted to downtown Charlotte. A transit planner explained that the major transportation infrastructure within the area, Interstate-77, was at its maximum physical capacity. In South Carolina and just inside the North Carolina border, Interstate-77 was an eight-lane roadway. Within the Interstate-485 beltway, urban development and bridge bottlenecking constrained the expansion of the interstate to six lanes. There were few alternate radial routes into the city, and gridlock was common in the area.

Initial concepts for the South Line focused on the Norfolk Southern right of way, though other alternatives were considered. As a transit planner explained, one of the possible alternate routes for the South Line was the South Boulevard arterial that paralleled Interstate-77 and the Norfolk Southern tracks. South Boulevard, which was four lanes with vehicle volumes exceeding 65,000 along much of its length, extended radially from central Charlotte to the Interstate-485 belt loop. The traffic on the arterial made the railroad alignment a more attractive option.

Relative to other corridors in the regional plan, the South Corridor was considered particularly ripe for generating the types of land use outcomes that had been envisioned. As one planner described the selection process, “There was so much more momentum, in terms of fulfilling and achieving truly transit oriented development. I think that corridor had a lot more momentum behind it from the development community, from property owners, from [our interpretation of] where we could be successful. And I don’t think there were many of the other corridors that were
as [well] positioned as the South Corridor was.” Also, a planner explained that several property-
owning constituents who had been proponents of the trolley alignment had promised to invest in
the South Corridor. As the planner described it, “We also had some grass roots folks who were in
what’s now called South End who were strong advocates for a pedestrian friendly type of
development, either with rapid transit or not. […] So I think we had to head south.”

Planning the South Corridor

According to numerous interviewees, including several FTA staff and FTA land use consultants,
close collaboration of local agencies led to a transit project that epitomized transportation and
land use coordination. Certainly, the region’s integrated efforts leading up to the project’s
implementation were critical to that. Also, the South Corridor project was planned by close-knit
consortium of Charlotte-Mecklenburg County agencies and their consultants. The Charlotte Area
Transit System (CATS) agency, formed within the consolidated city-county local government in
2000, led the planning effort and was the builder and operator of the South Corridor line. CATS
was under the same local government umbrella as the Charlotte Department of Transportation
(CDOT) and the Charlotte-Mecklenburg Planning Department (Planning), two organizations that
also played significant roles in the planning and implementation of the transit project.

Several planners that had worked on the Charlotte’s transit plans considered them to be more
land use-oriented than any others they had planned in other cities. Collaboration between transit
planners and land use planners was facilitated by the organizational structure of the transit
agency. As noted above, CATS was formed under the same local government umbrella as CDOT
and the local Planning Department. In fact, their offices were co-located on adjacent floors
within the same government building in downtown Charlotte, just blocks from the Charlotte
Transit Center and the downtown terminus of the light rail line. Staff members of the agencies
were able to regularly communicate face to face about the project and, as one land use planner
explained, “create a special work environment.”

Perhaps because the City’s rail transit program was nascent and a full staff of experienced transit
professionals had not yet been hired, land use planners played a major role in defining the
project’s design. In one interview, a land use planner who played an integral role in the transit
planning process reminisced about the team’s refrain during the South Corridor planning
process: “Transit isn’t the end, it’s the means for us to accomplish this new community that
we’re trying to build.” As one transit planner noted, “We had these joint collaborative meetings
and we did things which I think are pretty unique for transit agencies. We met [with the other
departments] and talked about where we wanted the parking lots. Not just, ‘Where’s the demand
[for parking] going to be?’” Another transit planner explained, “It was a real collaborative and
four or five-tier approach to building the community not just, you know, building a rail project.”

While land use professionals were noteworthy participants in transit planning, transit
professionals were also involved in the land use conversations. As one transit planner explained,
“One of the things that always concerned me about our plan here in Charlotte was its fit with the
size of the downtown population.” Reflecting the research of Pushkarev and Zupan (1977), he
went on to say, “We were talking about 55,000-60,000 jobs in the downtown area on a daily
basis and that worried me. I always had that in mind that we needed to have at least 100,000 jobs
to support five corridors of rapid transit. I had a lot of discussion with the downtown business
interest about attracting additional major employers for the downtown area.” Also, transit
planners referenced land use plans when refining station locations. As one transit planner
recalled telling a land use planner, “Land has to be [planned to] a certain intensity for us to consider a station there.”

The design of the South Corridor project also reflected local real estate development potential. As explained by a transit planner, “We’re not necessarily looking to build the cheapest line we can build, we want to build the one that will get over and serve the areas where the TOD wants to be located. Doing that I think has set us up for the future.” Another transit planner explained, “The emphasis for locating the stations was almost more development first, access second. Where did it make sense from a […] development perspective and the land use perspective to have stations, and then how can we provide access to those locations?” Based on this set of criteria, the original proposal for the project included 19 stations. As a land use planner explained, “The stations were considered beads on a chain, and they moved up and down as we considered the walkability of areas and other factors.” The interviewee went on to say, “There was political pressure to have more stations closer together. Every property owner wants to be right at the station and not farther away.”

The focus on walkability and development was particularly apparent along parts of the alignment close to downtown where the trolley had operated. Land use planners developed plans reflecting New Urbanist principles, articulating TOD villages within the walk-shed of each station. As one planner explained, the stations were aligned with particular cross streets and developable parcels that were considered integral elements of the planning staff’s vision for each area. At one point, planners successfully argued that real estate development potential and walkability in one area deserved two stations. This put them so close that the nearest ends of two station platforms were just 1000 feet apart, an unusual circumstance outside of a downtown or a relatively dense outlying area.

The entire alignment was even shifted off the existing freight rail right of way in one circumstance to accommodate real estate development near a proposed station. Scaleybark station and several hundred yards of track were located in the median of South Boulevard and southbound lanes were shifted west, all to provide greater access to land that was considered ripe for development by urban planners. The original Norfolk Southern Railroad tracks had been slightly elevated on a berm west of South Boulevard, blocking access from South Boulevard to several undeveloped acres of land. A planner explained that to promote transit oriented development, “We took out the berm and made the land accessible to the major thoroughfare and a rail station.”

In addition, the transit agency procured the vacant land behind the railroad berm so that the agency could promote development and capture some of the real estate value that transit infrastructure improvements were expected to generate in the area. To justify purchasing the parcel and making access improvements to it, the agency used much of the land as a park and ride facility with the option to expand the parking facility if necessary. Anticipating that development would happen leading up to or soon after transit service began, planners left part of the parcel vacant and developed a surface parking lot on the remainder (the development parcels, including the park-and-ride facility, are found to the left of the station platform in the picture below). Rather than spend money on durable parking infrastructure, planners modified the design of the parking facility to make it cheaper to build and easier to remove, including the use of lower quality building materials.
The shift to the median of a state highway garnered significant scrutiny from the North Carolina department of transportation who oversaw the roadway. This incurred some delay, occupied CATS staff time, and led to the City of Charlotte taking over operation and maintenance responsibilities for a section of the roadway. Additionally, the at-grade crossings required for trains to access the median strip triggered the installation of costly crossing equipment for the southbound lanes of South Boulevard. In addition to adding capital costs, the realignment of the roadway caused considerable issues for local businesses and residents during construction. Nonetheless, the opportunity for development at the station, particularly potential development on agency-owned land, outweighed those costs in the minds of planners. As I interviewed more numerous individuals who had participated in the planning of the project, each independently pointed to the Scaleybark Station as the signature example of the project’s focus on real estate development.

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In other parts of the alignment, transportation efficiency generally superseded land use visions. A transit planner recalled conversations in which land use planners called for a station’s parking facility to be located on a large parcel where a major food manufacturer operated a regional plant. The land use planners hoped to buy out the plant, the last remaining industrial facility in that area, to unlock the infill development potential of the area’s large single-owner parcels. The taking of the plant facility for parking would have been a legitimate use of eminent domain but would have required the agency to purchase the land for a fair price and help relocate the plant. The agency ultimately decided that a station would be located a few thousand feet south where land was more readily available.

Transit planners also eliminated other proposed stations along the project’s length to improve transit efficiency. As a transit planner explained, “I didn’t want to have a street car—a light rail running on a street car line, if you will—with stations every couple of blocks.” Transit planners sought to balance the operational requirements of light rail with the land use intentions of the region and local land use planners.

Even with a focus on transit efficiency in the southern parts of the line, real estate development was still a consideration. The Tyvola Station was designed on an elevated section of track such that new roadway infrastructure could be built below for both bus and park-and-ride access as well as adding automobile access to several former industrial properties and low-density strip retail properties that planners considered redevelopment opportunities. Likewise, transit planners explained that they located the Arrowood station proximate to several vacant parcels that were inaccessible to a major thoroughfare. As part of the station’s implementation, roadway infrastructure was constructed by the transit agency to provide bus connections but also in hopes of making a number of parcels more attractive for development.

The final project design reflected both the engineering efficiency of transit planners and the design-orientation of land use planners in an interesting way. The southern two thirds of the alignment’s length, up to Scaleybark Station, included six stations located near major east-west thoroughfares. The stations each had park-and-ride facilities that made up the vast majority of parking along the line. The line was grade separated in several locations such that there were only three at-grade road crossings.

In contrast, between downtown and the hyper efficient stretch of track in the south, there were five stations spaced one half-mile apart on average. Only Scaleybark had park-and-ride facilities and, as noted above, that parking was designed to be temporary and slated for redevelopment. The tracks passed through mid-density areas with numerous vacant parcels or low density warehouse uses. Reflecting planners’ notion that dense street grids and stations would spur the redevelopment of vacant and industrial properties into walkable transit villages, that section of the project included fourteen grade crossings and no elevated tracks.

Along the northernmost one-mile segment in downtown, there were four stations located two to three blocks apart with elevated crossings over an interstate and several streets. The project took on multiple personalities simultaneously. It met the desires of transit planners to attract commuters with a competitive travel time from the suburbs to the downtown but also met the wishes of land use planners by providing densely packed walk-up stations in areas where they believed transit-oriented development could be fostered.

Having not considered the question until our interview, some interviewees were surprised by the long list of project features that, in retrospect, they defined as real estate development-related.
Interviewees could not pinpoint the marginal cost of any one real estate development-related element of the project’s design, nor did they feel confident estimating the overall impact of real estate development considerations on costs.

However, it was apparent that the real estate development-related project elements came at cost when compared to a more mobility-oriented design. Interviewees acknowledged that the closely spaced stations incurred capital cost and reduced average operating speed on the line if compared to more traditional station spacing distances on light rail projects in similar situations. Grade crossings intended to maintain the walkability and desirability of the station area environs impacted operating speed and added safety equipment costs. Transit planners were very aware of the safety impacts of such features and recounted their occasional reluctance to incorporate the project elements associated with real estate development.

Yet, for planners, thinking of the real estate development-related components of the project as marginal elements that had been added to a simpler, more transportation-oriented project was difficult, if not impossible. Planners in Charlotte conceived of the project from its inception as a means of influencing land use patterns throughout the region. Fixed-guideway transit was considered a critical precursor to the type of smart-growth, radially oriented urban development pattern the region had outlined in plans since the early 1990’s. Rather than a purely transportation purpose, the project primarily served to shape real estate development.

**Real estate development outcomes**

Charlotte planners were focused on generating real estate development around the transit facility and did not rely only on transit infrastructure to spur private real estate investment. Several planners pointed out that the transit infrastructure, however real estate development-oriented, was not enough to overcome some of the obstacles to development that existed in some station areas, particularly infrastructure inadequacy. “[W]e took a] look at infrastructure at each one of these stops to determine, ‘How do we enhance access to these stations?’” and put in more local dollars in order for us to build more sidewalks, more streets.” A transit planner explained that the result of that inquiry was the establishment of an infrastructure fund. “So the city had a $50 million bond program that the voters approved to build an infrastructure and they also [invested in] another $10 to $12 million of utility improvements ahead of time, expanding the water sewer lines for the kind of development that would be required in those locations.” Further, the transit planner explained that those infrastructure expenses were costs that developers would not have to incur, which would make expensive dense development more financially feasible.

In fact, several projects proceeded only after infrastructure improvements were implemented. Development along the line was robust and planners pointed to several mixed-use apartment complexes, each with hundreds of housing units, as evidence of the physical changes the real estate investment had encouraged. Several office and mixed-use commercial developments also opened near new stations in downtown Charlotte. However, development slowed as the 2006 housing crises emerged and all but ceased once real estate lending tightened dramatically in 2008.

Ultimately, planners in Charlotte were very pleased with the transit-oriented development that had occurred around the South Corridor stations. They noted that CATS was frequently contacted by other cities for advice, had domestic and international guests tour the facility, and were profiled in numerous publications on transit-oriented development. Yet, many planners
expressed disappointment that some real estate development had not occurred as expected. In particular, they wished that more progress had been made at the Scaleybark station so that they could highlight the great efforts they had undertaken to make it their signature station for transit-oriented development.

**Implications of outsized transit-oriented development expectations**

I found that transit planners’ expectations for transit-oriented development led them to invest in costly modifications to transit planning processes and project designs. This was a widespread practice across the 19 regions where interviewees had participated in transit project planning. In many instances, efforts had not resulted in the real estate development that planners anticipated. Thus, the tangible benefits did not necessarily justify the costs. In some instances, interview evidence suggested that intangible benefits of their actions included political support for their transit agency or a particular transit investment, however ineffective the expenditure might have been. Based on these findings, we do not know if the transit planning profession has used the limited supply of transit capital funds as wisely as possible. In fact, I hypothesize that this form of inefficiency is a widespread phenomenon across the transit industry and should be studied further to understand the actual costs and benefits that have resulted, as they may be relatively small or quite significant.

What can be said based on the evidence at hand is that transit planners and others have expended considerable resources to promote transit-oriented development. Numerous organizations paid to reroute transit, relocate stations, and modify future transit operations. As shown in the case studies and explained by several interviewees who worked on transit projects in other regions, the modifications often came at considerable cost, including foregone benefits. For example, as discussed in the Interstate MAX case study, planners in Portland expended millions of dollars to fund a more expensive route alternative that was expected to be more expensive to operate, have fewer riders, but generate significantly more real estate development.

Beyond the marginal direct costs of rerouting alignments and relocating stations based on real estate development expectations, the additional investment of time and resources could be substantial. For example, local governments might invest in building transit, operating transit, building new roads, conducting urban planning processes, and providing financial subsidies for real estate development projects. As it relates to planning for real estate development around transit, funds were often allocated to conduct planning processes in all transit stations under the assumption that real estate development could occur in every location.

If local governments are expending resources, so are citizens. Citizens support all of the activities above financially—for example, by paying dedicated sales taxes—and also give their time to participate in participatory land use and transit planning processes. The private sector also makes substantial commitments based on the assumptions. For example, private foundations fund programs to address gentrification concerns around stations, allocating resources for the construction of affordable housing or other social equity efforts.

The decisions made by citizens, private investors, local governments, the federal government, and others based on these real estate development-related theories may result in significant opportunity costs. Assuming the same amount of public funding associated with real estate development-related transit project design elements would have been budgeted to transit and related expenses, it could have been used to align projects with areas where other transit project
goals could have been achieved or provided better transit service. For example, costs allocated to
building a station in a particular location to spur the redevelopment of brownfield properties with
few results might have otherwise been expended on better bus transfer facilities at all stations or
used to purchase higher-grade rolling stock with lower maintenance requirements.

Most importantly, in many instances, including the case of Interstate MAX, interviewees
lamented the fact that resultant station area real estate development was not what they had
expected. Transit planners’ real estate development expectations had helped motivate and justify
their efforts to modify transit planning processes and project designs. Many explained that the
real estate development and corresponding benefits would accrue eventually and believed
strongly that the costs were still justified. This suggests that future studies should consider the
time-weighted costs and benefits of real estate development-inspired transit planning practices.

The inefficiencies identified in this study raise questions about the efficiency of government
transit expenditures and require further investigation to determine whether the impacts are
relatively small or large. As one FTA staff person said about the land use impacts of transit
facilities, “You see projects around the country that just aren't doing what was promised, and
that’s unfortunate for everyone because it just sort of makes people question the value of transit
investment.” If the inefficiencies are found to be large, researchers and policymakers should
work to understand and reform inefficient real estate development-related transit planning
practices.
PART C: Real estate development-related theories of transit planning practice

Theory would suggest that transit planning practices are carried out by transit planners based on a set of theories-of-practice that reflect their understanding of the world around them (Schon 1983). However, research to-date has not considered the real estate development-related theories-of-practice that transit planning professionals employ. Based on the research design discussed in Section A-2, I found that transit planning professionals’ rely on theories-of-practice that are inconsistent with the academic literature and could lead to unrealistic expectations for transit-oriented development around transit investments. As discussed in Part B, expectations of transit-oriented development have inspired transit planners to make costly changes to transit planning processes and project designs. In addition, it appears that inconsistent theories-of-practice regarding transit-oriented development are also applied by the federal New Starts policies such that federal funds may be allocated to projects that do not perform as expected. This research provides an understanding of the rationality that reinforces particular practices, a critical step in reforming problematic actions (Flyvbjerg, Landman, and Schram 2012).

While theories-of-practice are often tacit constructs, Schon (1983; 1990) argues that they can be revealed through the “espoused theories” practitioners rely on when describing the work of their profession and, particularly, when reflecting on their own practice. Ultimately, 96 interviews with transit planners, federal policymakers, and federal policy implementers yielded data pertinent to the investigation. I also reviewed federal policy documents to better understand policymakers’ theories. In this section, I discuss observations from my review of these data—including similarities, diversity, and inconsistencies across practitioner’s statements—and present the taxonomy of espoused theories that I developed in response. I also detail the inconsistencies that I determined existed between practitioners’ theories and theories found in the scholarly literature. Finally, I discuss evidence regarding how such inconsistent theories might emerge and persist—hypotheses that can inform future research.

Distinct from the other findings in this dissertation, which consider transit planners’ project-specific practices and their outcomes, this part of the dissertation discusses the causal mechanisms that transit planning professionals—transit planners, federal policymakers, and federal policy implementers—believe enable transit planners’ actions to impact the world around them in certain ways. This research delves into practitioners’ interpretation of the real estate development-related purposes of practices, rationales for their real estate development-related actions, and interpretations of the real estate development-related theories that circulate in their profession. In the taxonomy, I have tabulated theories that I heard from at least one source. Thus, the findings of this research are unique to the individuals that I interviewed and the documents that I studied, serving only as evidence that the theories-of-practice exist. This research does not speak to the prevalence of these theories across U.S. transit planning practice.

**Insights from transit planning professionals’ statements**

As I conducted interviews and reviewed transcripts, I was struck by four observations. First, transit professionals described very diverse causal pathways to explain a concept they widely shared: transit investments lead to Smart Growth urban development. Second, I was struck that many interviewees indicated that their expectations for Smart Growth development around the transit projects they worked on had not been met. Third, aspects of interviewees’ diverse
explanations of causal pathways actually contradicted statements made by others in mutually exclusive ways that suggested several patterns of thought. Finally, I was struck that some practitioners explained that others in the field of transit planning relied on theories that contradicted the best knowledge on the subject and, basing their transit planning on those theories, were promoting transit projects that were not an efficient use of finite transit funds. In the following sections, I discuss these observations in greater detail.

**Transit investments lead to “Smart Growth” urban development**

Without exception, interviewees suggested that either transit investments themselves or their attendant impacts on local conditions (e.g., land use policy changes inspired by transit investments) would influence real estate development outcomes in many, if not all, transit station areas and the surrounding region. Though some interviewees suggested that transit investments and their secondary effects may not lead to Smart Growth urban development immediately, they explained that investments would contribute to Smart Growth outcomes eventually. They considered transit investments to be a critical part of the infrastructure necessary for certain types of built environments to be maintained, to be built anew, and to replace older car-oriented real estate. In particular, many interviewees considered transit investments a precursor to the type of dense, walkable, environmentally sustainable development advocated by the Smart Growth movement. Interviewees often described the type of real estate development resulting from transit as “Smart Growth,” “livable,” “transit-supportive,” or “transit-oriented” places—all descriptions related to both Smart Growth and New Urbanist rhetoric.

Transit planning professionals from across the country, in regions of diverse sizes and histories, considered transit an essential element of improving cities. For example, a planner on the Dulles Rail project in northern Virginia viewed transit investment as a means to an end, complementing his explanation with an example. “The alignment through Tysons was heavily influenced by Fairfax [County’s] desire to turn Tysons Corner from a suburban office complex with no residences and a shopping Mecca into an edge city with a lot of modern development having to be heavily TOD-oriented.”

When asked if the federal government was specifically promoting Smart Growth with its transit funding choices, one U.S. DOT staff person suggested it would be unwise if they did not promote Smart Growth urban development with FTA’s discretionary investments. During our interviews, FTA staff relied on the terms “transit-supportive development” or “transit-oriented development” to describe the type of real estate development they anticipated would be implemented around federally-backed transit investments. As one FTA staff person explained about New Urbanist prescriptions for Transit Oriented Development, “Transit also serves, I think, to support a kind of an urban form of a certain nature.” Another staff person considered transit a critical investment for regions that were “targeting growth in a particular area.” One FTA staff person explained the process that Metropolitan Planning Organizations could take to ensure that real estate development occurred around their transit investments as a linear process. “The model really is: have a vision, have a 20-year plan for your community, [and] identify those areas where you’re going to concentrate growth. It's sort of Smart Growth 101.”

**Patterns among diverse causal explanations**

When I asked interviewees about why and how transit investments contribute to Smart Growth urban development, a surprisingly diverse tapestry of theories-of-practice emerged given that all
of the viewpoints reached the same conclusion. Some interviewees explained the relationship between transit investments and real estate development based on concepts that were mutually exclusive to what other interviewees suggested, piquing my interest and leading me to dig deeper during interviews into the details of the different causal pathways.

In my first round of analysis, I wrote case studies of individuals’ explanations that illuminated the conflicting viewpoints that were present within the same profession and helped me identify several patterns. First, I found that practitioners had varied views about the direct impact of transit investments on real estate development. Some practitioners believed transit could have profound direct influence on real estate development while others thought transit investments would generally have little or no direct impact. Second, I found that practitioners fell into two camps with regard to their views on the second-order impacts of transit investments on real estate development. Interviewees tended to say either that transit investments would spur the adoption of transit-supportive land use plans and policies specifically or that transit investments would spur changes to a litany of real estate development factors, often including land use plans and policies.

The views of interviewees fell into one of the four categories defined by the combination of these two dimensions—direct impacts and second-order influences. As an example, several practitioners made statements suggesting that transit leads to transit-oriented development once transit-supportive land use plans are adopted and allow it to happen. To explain how transit investments would lead to Smart Growth urban development, their viewpoints were composed of two notions: (1) that transit had direct impacts on real estate development and (2) that transit investments would spur changes to land use plans and policies. In several instances, interviewees who shared this composite theory considered changes to land use plans and policies imminent because federal transit funding policies have led to widespread adoption of transit-supportive land use plans around transit projects. Therefore, according to their view, it was imminent that transit-oriented development would occur around transit stations. Examples of four distinct theoretical vantage points, including the example above, are described in the table below.
### Table 13 – Elemental makeup of example composite theories

<table>
<thead>
<tr>
<th>Example composite theory</th>
<th>Elemental theoretical categories regarding direct impacts of transit investments</th>
<th>Elemental theoretical categories regarding second-order impacts of transit investments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit leads to transit-oriented development once transit-supportive land use plans are adopted and allow it to happen.</td>
<td>Transit investments directly influence real estate development</td>
<td>Transit investments trigger changes in addition to land use policies</td>
</tr>
<tr>
<td>Modern transit investments have no direct impact on accessibility or real estate development, but transit-supportive land use policy changes spurred by transit investments can encourage or determine real estate development in new station areas.</td>
<td>Transit investments have little or no direct impact on real estate development</td>
<td>Transit investments spur the adoption of transit-supportive land use policies</td>
</tr>
<tr>
<td>Transit could profoundly directly impact real estate development but transit-supportive land use policies are often infeasible to implement. Transit investments trigger real estate development subsidies and other real estate investment inducements that overcome the issues created by the land use policies.</td>
<td></td>
<td>Transit investments trigger changes in addition to land use policies</td>
</tr>
<tr>
<td>Transit has little or no direct impact on real estate development, but can trigger changes to local conditions—such as infrastructure, real estate development subsidy programs, land use policies—so that real estate development will occur in station areas.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I found that the two categories of practitioners’ views related to transit investments’ direct impacts were generally mutually exclusive of one another; views that transit investments would have profound direct impacts were certainly opposite of views that transit would have no direct impacts. The two categories of views related to second-order impacts were sometimes mutually exclusive, although not always. Recognizing this pattern motivated me to deconstruct all of the statements that were made by practitioners during our interviews and that I identified during policy document reviews.

**Deconstructed explanations – Taxonomy of theories**

Explanations of transit investments’ impacts on real estate development were often complex rationales made up of several constituent theories. Parsing them using the coding process described in Section A-2, I identified each elemental theory that was stated by at least one interviewee or one policy document. My analysis found that, in total, sources espoused nearly 70
distinct elemental theories when explaining the relationships between transit investments and the Smart Growth urban development outcomes they anticipated. Ultimately, a review of my coding of the 96 interviews revealed that very few sources relied on the same subset of elemental theories when explaining how transit investments informed real estate development.

The taxonomy was derived from two types of data: interviews and policy documents. I relied predominantly on my conversations with nearly 100 interviewees, a diverse mix of transit agency planners, regional agency planners, transit planning consultants, original New Starts policymakers, current FTA staff, and FTA land use evaluators. As described in Section A-2, my data collection process included semi-structured interviews that evolved over the course of my investigation. In some of my initial interviews, I asked practitioners about instances when transit projects had been designed with real estate development in mind. The conversations sometimes yielded only a few insights into the logic that interviewees used when considering real estate development around transit. In other cases, transit professionals elaborated on their views at length, sometimes commenting on their views relative to other transit planning professionals. In later interviews, I asked interviewees directly about their general thoughts on the relationship between transit investments and real estate development, often seeking clarification when it was unclear whether their statements applied universally or to one transit project or station area.

I also analyzed the views expressed in the New Starts policy language and related New Starts policymaking documentation. As discussed in Section A-2, because public policies reflect dominant discourses and certain practice norms, they serve as a valuable source of espoused theories that help illuminate an industry’s theories-of-practice (Yanow 2000). Several interviewees affirmed this notion as they described the participatory nature of New Starts policymaking—something I witnessed firsthand during FTA-sponsored policymaking discussions—and the influential role that the New Starts policies play in normalizing certain transit planning practices, processes, and theories.

This analysis served to prove the existence of elemental theories and allowed me to conduct the comparative analysis described below. Note that this qualitative analysis does not speak to how widely these theories are held by practitioners, nor to what extent the theories have informed transit planning processes or project designs. This taxonomy can serve as the foundation for future research on those topics.

The remainder of this section describes my sources’ elemental theories. Reflecting the categorizations that emerged during my analysis, I distinguish between theories relevant to transit investments’ direct impacts on real estate development and theories regarding transit investments’ influence on factors seen as intervening in real estate development around transit. I also identified a third category of theories focused on one of the most commonly discussed intervening factors, land use plans and policies, and how sources viewed their influence on real estate development outcomes. Tables include definitions of the espoused theories and identify which set of sources stated them. To be clear, while some of these theories were cited by only one individual, many were cited by multiple parties. For ease of reference, each theory in the tables has been assigned a number by which it is referred in subsequent sections.

**Transit investments’ direct influences on real estate development**

Both interviewees and policy documents referred to transit investments’ direct influence on real estate development. When describing a causal pathway between transit investments and real estate development, many sources focused on increased accessibility generated by new transit
investments, others considered latent demand for transit-served locations, and some sources spoke of other direct causal pathways. Few espoused theories actually addressed the supply of real estate, focusing instead on transit’s ability to influence demand for real estate such that sites near transit stations became an attractive option for real estate developers. The following table describes the breadth of the relevant espoused theories and which sources stated them.

Table 14 – Theories regarding transit investments’ direct influences on real estate development

<table>
<thead>
<tr>
<th>#</th>
<th>Theory</th>
<th>Planners</th>
<th>FTA Staff</th>
<th>FTA Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demand for real estate in station areas increases due to the accessibility provided by transit investments and can contribute to real estate development</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>Transit investments increase accessibility to station areas which leads to real estate development if sites are available for development and transit-supportive development is described by local land use policies</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The accessibility provided by fixed-guideway transit services cannot be easily eliminated (because of sunk infrastructure costs) which leads to real estate development if sites are available for development and transit-supportive development is described by local land use policies</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>The accessibility provided by regular, all-day, fixed-guideway transit services cannot be easily eliminated (because of the sunk infrastructure costs) which leads to real estate development if sites are available for development and transit-supportive development is described by local land use policies</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The agglomerative benefits afforded by rail transit will lead to real estate development if sites are available for development and transit-supportive development is described by local land use policies</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>The accessibility provided by transit investments allows residents to reduce their automobile costs and pay more for housing which makes real estate development more likely in all station areas</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>The accessibility provided by transit investments allows property users to reduce their automobile ownership rates and/or attracts property users with low auto usage/ownership rates such that developers can provide less parking, making real estate development more financially feasible and more likely in all station areas where public policies allow reduced parking provision</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Transit investments can directly impact real estate development irrespective of the accessibility afforded to station areas</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Transit investments spur real estate development in all station areas leading up to and following soon after a transit investment because of the latent demand for transit-served real estate from a subset of the marketplace made up of transit-sensitive households and firms</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Transit investments will lead to real estate development in all station areas because of the demand for transit-served real estate from a fast-growing subset of the marketplace made up of transit-sensitive households and firms</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Transit investments will lead to real estate development in station areas because transit is a lifestyle amenity, irrespective of its usefulness, that attracts firms and segments of the population that are attractive clients for real estate developers</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Some real estate developers say they seek out sites near transit, making real estate development likely around new transit facilities</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Intervening factors and transit investments’ second-order influences on real estate development

While transit investments were described by many interviewees as directly impacting the demand for real estate such that transit-supportive development could be expected in station areas, some sources argued that real estate development might be precluded in some circumstances by intervening factors. Sources also suggested that transit investments could spur changes to local conditions and policies to address such intervening factors and lead to real estate development.

As one transit planner in Charlotte suggested, “You can’t just throw transit out there and say we’re done, it just doesn’t work that way.” He argued that infrastructure investments, land use policy changes, and numerous other actions had to be implemented to “nurture” transit-oriented development.

Policymakers involved in the formulation of the original New Starts land use policies also explained that Knight and Trygg’s (1977b) seminal report was an influential source of information during the drafting of the policies and informed their appreciation of real estate development precursors. As one policymaker explained:

“So if you've got developable land, if you've got plans and policies that take [it/you] in the right direction, and [if you’ve got a supportive] economic climate, that means that there is a willingness to build. And transit accessibility. That’s all we thought led you to the likelihood of there being more [real estate] development there. When you look back
at it, only one of those has anything to do with the project, the transit accessibility. The other three could be done regardless.”

Rather than measure the accessibility generated by transit investments, New Starts policymakers explained that FTA’s evaluations would focus on the “land use inputs—that is to say, on the set of local policies and processes in place (or proposed) to achieve the locally-specified land use goals” (Federal Transit Administration 1994b, 58).

**Table 15 – Theories regarding factors that intervene in transit investments impact on real estate development**

<table>
<thead>
<tr>
<th>#</th>
<th>Theory</th>
<th>Espoused by:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Planners</td>
</tr>
<tr>
<td>19</td>
<td>Factors such as adequate real estate market demand, land availability, infrastructure adequacy, and accommodating land use policies are each necessary but not sufficient conditions for real estate development to occur in station areas</td>
<td>X</td>
</tr>
<tr>
<td>20</td>
<td>Transit investments can generate the political will to address the various factors that preclude real estate development in station areas</td>
<td>X</td>
</tr>
<tr>
<td>21</td>
<td>The lack of a “transit-friendly culture” or the existence of a strong “car culture” in a region can preclude real estate development around transit stations</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Unless financial subsidies are provided to developers and investors, station area real estate development is predicated on sufficient market demand</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Regional job growth, population growth, or real estate market fundamentals indicate the potential for real estate development in station areas</td>
<td>X</td>
</tr>
<tr>
<td>24</td>
<td>Regional demand for particular real estate products indicates the potential for real estate development in station areas</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Growth and market fundamentals must be adequate in the transit corridor for significant real estate development to occur around transit investments</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Growth and market fundamentals must be adequate in station area sub-markets for significant real estate development to occur in station areas</td>
<td>X</td>
</tr>
<tr>
<td>27</td>
<td>Feasibility analyses of development typologies across corridors and station areas are predictive of the types of development that will be feasible in those locations</td>
<td>X</td>
</tr>
<tr>
<td>28</td>
<td>The recent construction of transit-supportive development in the region demonstrates the potential for similar real estate development around proposed transit investments</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>The recent development of real estate projects in particular parts of the region is predictive of future development in those same areas</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>The recent development of real estate projects in close proximity to the proposed transit facility is predictive of future development in those same areas</td>
<td>X</td>
</tr>
<tr>
<td>31</td>
<td>Pre-existing mixed-use development proximate to proposed transit facilities is predictive of the potential for transit-supportive development in those same areas</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>The recent development of real estate projects that reflect a jurisdiction's land use plans are a sign that there will be future development around proposed transit stations in that jurisdiction reflecting their transit-supportive land use plans</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Evidence that local developers are interested in or experienced with transit-supportive development projects supports the notion that transit-supportive development is likely to occur in proposed station areas</td>
<td>X</td>
</tr>
<tr>
<td>34</td>
<td>Developers’ stated interest in building projects around proposed transit stations is evidence that transit-supportive development is likely to occur there</td>
<td>X</td>
</tr>
<tr>
<td>35</td>
<td>Transit agency and MPO training programs that introduce the real estate community to transit-oriented development principles are evidence that transit-supportive development is likely to occur in proposed station areas</td>
<td>X</td>
</tr>
<tr>
<td>#</td>
<td>Theory</td>
<td>Planners</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>36</td>
<td>Developer involvement in transit and station area land use planning is evidence that transit-supportive development is likely to occur in proposed station areas</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Landowners must be willing and able to develop their properties for real estate development to occur around transit stations</td>
<td>X</td>
</tr>
<tr>
<td>38</td>
<td>The simplifying or expediting of an onerous or extended real estate development approvals process is evidence that transit-supportive development is likely to occur in station areas</td>
<td>X X X</td>
</tr>
<tr>
<td>39</td>
<td>The provision of financial subsidies can influence the decision to proceed with some real estate development projects</td>
<td>X X X</td>
</tr>
<tr>
<td>40</td>
<td>The provision of financial subsidies for development projects is evidence that transit-supportive development is likely to occur in station areas</td>
<td>X X X</td>
</tr>
<tr>
<td>41</td>
<td>Transit investments can influence real estate development by ameliorating unsightly aspects of the built environment in the vicinity of transit investments</td>
<td>X</td>
</tr>
<tr>
<td>42</td>
<td>The adequacy of station area infrastructure is a necessary but insufficient condition for real estate development to occur</td>
<td>X X X</td>
</tr>
<tr>
<td>43</td>
<td>The adequacy of basic station area infrastructure--sewer, water, gas--is a necessary but insufficient condition for real estate development to occur</td>
<td>X</td>
</tr>
<tr>
<td>44</td>
<td>Station area real estate development is more likely if robust automobile access is provided to station area parcels</td>
<td>X</td>
</tr>
<tr>
<td>45</td>
<td>The provision of walking trails, streetscape improvements, and other forms of non-essential infrastructure in station areas is evidence that transit-supportive development is likely to occur in station areas</td>
<td>X X X</td>
</tr>
<tr>
<td>46</td>
<td>The provision of infrastructure described in transit-supportive land use plans is evidence that transit-supportive development is likely to occur in station areas</td>
<td>X</td>
</tr>
<tr>
<td>47</td>
<td>Existing parcel characteristics are indicative of the potential for real estate development to occur on station area parcels</td>
<td>X X X</td>
</tr>
<tr>
<td>48</td>
<td>The presence of vacant parcels in a station area is evidence that there is potential for transit-supportive development to occur in that station area</td>
<td>X X X</td>
</tr>
<tr>
<td>49</td>
<td>The presence of brownfield sites in a station area is evidence that there is potential for transit-supportive development to occur in that station area</td>
<td>X X X</td>
</tr>
<tr>
<td>50</td>
<td>The fact that a station area parcel is designated as a brownfield is an indicator that real estate development on the site is unlikely</td>
<td>X</td>
</tr>
<tr>
<td>51</td>
<td>The presence of abandoned or underutilized properties in a station area is evidence that there is potential for transit-supportive development to occur in that station area</td>
<td>X</td>
</tr>
<tr>
<td>52</td>
<td>The presence of consolidated parcels or large assemblages under single ownership in a station area is evidence that transit-supportive development is likely to occur in that station area</td>
<td>X X X</td>
</tr>
<tr>
<td>53</td>
<td>A high ratio of improvement value to land value of a station area parcel can indicate a low likelihood of redevelopment on that parcel</td>
<td>X X X</td>
</tr>
<tr>
<td>54</td>
<td>Local land use policies can prohibit transit-supportive development or any form of real estate development from occurring in station areas</td>
<td>X X X</td>
</tr>
<tr>
<td>55</td>
<td>The presence of transit-supportive land use plans and policies in a station area is evidence that transit-supportive development is likely to occur in that station area</td>
<td>X X X</td>
</tr>
</tbody>
</table>

**Influence of transit-supportive plans and policies’ on real estate development**

As discussed above, a number of sources defined land use plans and policies as intervening factors that could stymie real estate development in station areas. Many sources also explained
how changes to land use plans and policies could influence real estate development around transit investments. In this section, I define “land use plans and policies,” discuss the inconsistencies between the relevant espoused theories and scholarly theories, and provide a table with all the related espoused theories.

Defining land use plans and policies
To define the term “land use plans and policies”, I rely on interpretations of statements made by interviewees. As identified in the section above, numerous interviewees discussed planning and policymaking actions that could be taken, primarily by local and regional governments, to address factors that could intervene in real estate development around transit. Some of those actions included reducing permit and impact fees, expediting development approvals, and providing direct financial subsidies to projects—all of which could be considered subsets of “land use plans and policies.” However, when discussing the importance of such plans and policies, the vast majority of interviewees referenced visionary participatory planning processes and resultant land use controls, at both the local and regional levels. The controls included regional growth management techniques like growth boundaries and local measures like bulk, use, and design restrictions typically found in zoning policies and associated design guidelines.

Frequently, interviewees referred to a “TOD policy” or a “TOD planning process” when responding to my questions about land use plans and policies. When I asked for clarification from a Massachusetts transit planner who used the term “TOD planning”, he highlighted the participatory nature of the process:

“There’s always a lot of hurdles in trying to get more dense housing and more commercial and retail space being built anywhere because people are worried about traffic, they’re worried about changing the character of their community. So that’s just an overall challenge in getting anything built. So that was something that we tried to actively manage through putting together visualizations and doing really robust public participation process.”

Similarly, when asked what he considered “TOD” plans and policies, a transit planner working for the transit agency in Charlotte described the type of station area planning process undertaken to encourage real estate development around the city’s transit investments:

“We usually have a station area planning process that is run by the planning department. We are a party to that. The planning department usually draws a typical half-mile circle around the station and then they do some kind of broader planning in those areas a quarter-mile or a half-mile out [to define] a development vision for those areas. We're a party to that.”

Likewise, FTA policymakers devising the first drafts of the New Starts land use evaluation policies also spoke of a “half-mile radius around stations” (Federal Transit Administration 1994b, 63). New Starts policies have also consistently scored applications based on the inclusiveness of the planning process and whether the development community participated in land use planning (Federal Transit Administration 1996b; Federal Transit Administration 2013b).

A New Starts grant application evaluation factor titled “transit supportive corridor policies” is assessed based on policies to increase development, to enhance the transit-friendly character, to improve pedestrian facilities, and to address parking policies (Federal Transit Administration
To score a “high” rating on the assessment, plan revisions have to have been “adopted or drafted” for “most or all station areas.” Another related factor titled “Supportive zoning regulations near transit stations” focuses on zoning ordinances that increase development densities, enhance the “transit-oriented character” of development, and adjust parking and traffic requirements (Federal Transit Administration 2013b, 14).

Based on the evidence, I interpret “land use plans and policies” to be community-driven visions of future land uses, including corresponding infrastructure, and the policies—typically regional plans, zoning codes, and design guidelines—that describe the bulk, uses, and design of new development, including automobile parking provision.

Table 16 – Theories regarding the influence of land use plans and policies on real estate development

<table>
<thead>
<tr>
<th>#</th>
<th>Theory</th>
<th>Espoused by:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Planners</td>
</tr>
<tr>
<td>56</td>
<td>Transit-supportive land use plans and policies allow real estate development to occur in station areas</td>
<td>X</td>
</tr>
<tr>
<td>57</td>
<td>The adoption of transit-supportive land use plans and policies in a station area encourages development and is evidence that transit-supportive development is more likely to occur in that station area than if they were not adopted</td>
<td>X</td>
</tr>
<tr>
<td>58</td>
<td>The adoption of transit-supportive land use plans and policies in a station area allows transit-supportive development to be built without requiring lengthy and costly approvals processes, making development more financially feasible and more likely to occur</td>
<td>X</td>
</tr>
<tr>
<td>59</td>
<td>The adoption of transit-supportive land use plans and policies that allow for reduced parking requirements or cap parking provision in station areas reduces development costs, making real estate development more financially feasible and more likely to occur</td>
<td>X</td>
</tr>
<tr>
<td>60</td>
<td>The adoption of transit-supportive land use plans and policies that allow greater density on properties in station areas increases the revenue potential of developers, making real estate development more financially feasible and more likely to occur</td>
<td>X</td>
</tr>
<tr>
<td>61</td>
<td>The adoption of transit-supportive land use plans and policies that allow greater density on properties in station areas increases the expectations of landowners and their pricing may preclude financially feasible development on sites in station areas</td>
<td>X</td>
</tr>
<tr>
<td>62</td>
<td>The adoption of New Urbanist land use plans and policies in a station area is evidence that transit-supportive development is more likely to occur in that station area than if other Smart Growth plans and policies were adopted</td>
<td>X</td>
</tr>
<tr>
<td>63</td>
<td>Land use plans and policies determine when, where, and what type of real estate development will occur in a station area</td>
<td>X</td>
</tr>
<tr>
<td>64</td>
<td>Local governments’ land use planning and policy authority (e.g., zoning) determine when, where, and what type of real estate development will occur</td>
<td>X</td>
</tr>
<tr>
<td>65</td>
<td>Regional governments’ land use planning and policy authority (e.g., long-range land use visions) determine when, where, and what type of real estate development will occur</td>
<td>X</td>
</tr>
<tr>
<td>66</td>
<td>Land use plans and policies are like urban construction documents that, when passed, determine where and what type of real estate development will occur in the near-term</td>
<td>X</td>
</tr>
<tr>
<td>67</td>
<td>Transit-supportive land use plans are based on idealized visions and derived during extensive community input processes that can lead to the adoption of plans and policies that prescribe real estate developments that are not economically feasible</td>
<td>X</td>
</tr>
<tr>
<td>68</td>
<td>Transit-supportive land use plans are long-term visions for an area that are based on idealized notions of urban development and are not necessarily intended to be implemented in the short-term</td>
<td>X</td>
</tr>
</tbody>
</table>
Inconsistencies between espoused theories and the academic literature

During the course of interviews, planners brought to my attention that they had witnessed people in the transit planning profession act based on theories that were inconsistent with academic research, arguing further that the practices resulted in little transit-supportive development and underperforming transit projects. As my data collection process progressed, I asked interviewees more in-depth questions to better understand the theories they applied to their practice to see if they could be distinguished from those found in the seminal pieces of the academic literature discussed in the literature review in Section A-1. As Schon (1983, viii) suggested for inquiry into the epistemology of practice, the questions to be asked are “What is the kind of knowing in which competent practitioners engage? How is professional knowing like and unlike the kinds of knowledge presented in academic textbooks, scientific papers, and learned journals?” Through such inquiry, Schon sought to understand how both practitioners’ and scholars’ theories could be enhanced.

Reviewing my taxonomy, I found that practitioners and policy documents included many theories that were reminiscent of the academic literature but were oversimplified and decontextualized versions. In this section, I pay particular attention to inconsistencies that could lead practitioners to expect more real estate development around transit projects than is realistic, something that can contribute to ineffective and inefficient transit planning practices. Note that there are instances when incompatible theories might exist and persist for rational reasons in spite of ineffectiveness and inefficiency—a finding that I will explore in a later section.

Ironically, my comparative analysis was inspired by transit planners who suggested to me that other practitioners in their field used theories that were inconsistent with academic research. Yet, I found that those same informants who had pointed to the faults of others also used oversimplified, decontextualized versions of academic theories when explaining how transit investments influence real estate development.

This analysis privileges academic theory by making it the point of comparison. I do so while recognizing that our knowledge of the world, that of both practitioners and researchers, is incomplete and fallible, with new theories replacing demoted or disproven theories (Kuhn 1962). I also recognize that knowledge claims are socially-produced, contextual interpretations (Schon 1983; Yanow 2000). However, according to the theory of judgmental rationalism, which respects interpretive pluralism, academic rigor can form the basis for claims of validity above many other knowledge claims (Bhaskar 2008). Following this rationale, researchers studying Scandinavian policy documents problematized the fact that policymakers espoused transportation and land use-related knowledge claims that conflicted with those in the academic literature, suggesting that the ability to achieve stated goals could be judged on whether proposed actions were productive or unproductive according to the best available peer-reviewed knowledge (Næss et al. 2013).

Similarly, I compare the inconsistency of practitioners’ espoused theories and scholarly theories as a first step toward understanding the efficacy of transit planning practices that are focused on achieving transit-supportive development around proposed transit facilities. Further interrogation of inconsistent espoused theories and their application in practice may be one avenue for making professional practice more effective. I also found several theories that have not been discussed in the academic literature that could serve as topics of future research.
Transit investments’ direct influences on real estate development

Many transit planning professionals referenced the accessibility generated by transit investments when explaining the influence of transit investments on real estate development. Some practitioners’ statements reflected the nuances of what is found in the literature (theory 1 in Table 14 above) and most practitioners’ statements regarding access were thematically similar to what has been said in the academic literature. However, some interviewees stated theories that were oversimplified or decontextualized versions (theories 2-7). The application of such theories in practice could contribute to outsized expectations for real estate development around proposed transit stations.

The academic literature suggests that access improvements are the main causal mechanism for changes in people’s and firms’ willingness to pay for real estate and only when that increment is sufficiently valuable can it influence real estate development decisions. However, many interviewees’ statements suggested that all transit stations would experience accessibility gains sufficient to impact real estate development. For instance, a transportation professional in Massachusetts suggested, “I think there’s an estimate that there’s a 25% premium on real estate values to be located near transit.” When I asked about the contexts in which that premium occurs, he responded, “It’s kind of a standard.” In fact, the academic literature suggests that transit investments may generate positive, neutral, and even negative impacts on real estate values. Additionally, the interviewees’ theories did not distinguish between the access provided by transit stations built in already highly accessible locations, including those with relatively high existing transit accessibility and little room for improvement, and the access provided by stations where the incremental access they generated was considerable.

Notably, one interviewee acknowledged conflicts between the scholarly views and his own theory about the impacts of transit investments on real estate development. As he explained, he did not believe the scholarly view of the topic.

“I went to graduate school. They wouldn't let me do any papers on the influence of transit on land-use. Do you know what they said? They said, ‘Outside of Chicago, New York and a few other heritage cities on the East Coast, the land-use impact of transit is zero. It's all determined by automobiles. And if you say otherwise, you're going to have to prove it, mathematically.’ Well, I started to prepare to do it and my friends took me aside, my fellow graduate students, and they said, ‘Forget it. Get the degree by any means necessary and get out. Don't prove it to them in a paper. Go out and do it in reality. It's not worth your while, the hell with it.’ So, I took their good advice.”

Further, several practitioners believed that increased transit accessibility would influence parking demand and supply similarly to how it would influence the demand and supply for other types of real estate (theory 7). In addition to neglecting the variability of accessibility, transit access is not the only factor that influences parking provision in real estate developments. For example, parking provision may be determined by tenant standards that are insensitive to transit access. Also, parking is not always a constraint on real estate development such that addressing its supply will automatically influence real estate development outcomes. For example, parking may not be a significant financial component of a real estate project’s costs with or without transit access. The influence of transit access on parking, and real estate development project more

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22 The theories discussed in this section can be found in Table 14.
generally, is site- and situation-specific. The application of such a theory in practice could lead to outsized expectations for real estate development around transit stations.

Several practitioners also suggested that the demand for transit served locations from households, firms, and developers would invariably lead to development around newly constructed transit stations (theories 9-12).

Some practitioners also made statements reflective of the notion that a location’s access to any new transit station would lead to real estate development if the site were available for development and land use plans allowed it (theories 13 and 14). They suggested that development was more likely closer to transit stations than further away but equally likely at a given distance across stations. In several instances, sources identified specific developments that had occurred in their region to justify the assertion. For example, system planners in Dallas pointed to high-end real estate projects that had occurred close to Red Line stations as evidence that development was therefore likely on similarly positioned sites in all other Red Line station areas. Several interviewees specifically referenced “the academic research on transit access” that said values were highest close to the station and declined every foot one moved away from a station. Sources appeared to have misinterpreted research on transit accessibility and land values.

Several sources suggested that different transit modes were correlated with different scales of real estate development (theory 15). This may reflect the notion that different modes confer different levels of access, are more visually appealing, or have greater attraction for developers. However, as stated, the theories did not appreciate the distinct contexts in which transit projects are built. A transit planner in Los Angeles suggested that streetcars were associated with three-story buildings while light rail would yield taller structures. Similarly, a transit planner in Portland suggested that they anticipated expansion of the MAX light rail system to generate three to five-story mixed-use buildings in the vicinity of stations. When I asked an FTA staff person about the ways in which New Starts policies’ rewarded applicants for allowing higher land use densities in station areas, he explained that the density levels found in those criteria (e.g., 8.0-10.0 floor-area-ratio equates to a medium-high rating (Federal Transit Administration Office of Planning 2013)) were based on the standard expectations for the scale of station area development and that the ranges provided leeway for variations in development due to different transit modes or other factors. This form of causal oversimplification looked at one factor, the type of transit, to predict real estate development. In contrast, scholarly work has suggested that there are numerous necessary but individually insufficient considerations that determine real estate development outcomes around transit.

Finally, while several transit planners discussed potentially negative impacts of transit on real estate development, they also suggested that transit always conferred such substantial benefits that the negatives were outweighed (theory 16). For example, a transit planner noted the traffic conflicts created by a particular transit facility but responded to my questions about the potential impacts on real estate development with an argument that transit investments always conferred positive benefits overall. In fact, the literature suggests that transit can have negative externalities that are quite large and are reflected in land values. Any generalization of transit investments’ benefits and costs will not capture the context-specificity of real estate development potential around transit and could lead practitioners to overestimate the potential for transit-oriented development.
Intervening factors and transit investments’ second order influences on real estate development

Given the prominence of the concept in the academic literature, it was not unexpected that several practitioners stated that a transit investment’s impacts on real estate development could be constrained by a number of intervening factors (theory 19 in Table 15 above). Also consistent with the literature, several sources stated that transit could encourage changes to local conditions and public policies such that real estate development would be more likely in station areas (theory 20). However, other statements made by numerous sources conflicted with scholarly research in ways that could lead one to overestimate the potential for real estate development in station areas. In particular, the site-specific feasibility of development was all but ignored in many stated theories.

The academic literature corroborates sources’ espoused theories that suggested development will be unlikely, at least without subsidy, when demand is relatively low—for example, when real estate prices are well below the cost of supply (theory 22). However, the inverse is not considered true. For example, some sources suggested that strong market demand in the region or in the corridor was predictive of real estate development in station areas (theories 23, 24). However, when regional markets are “strong” or prices in the transit corridor exceed the cost of construction, development is not necessarily feasible in all locations. Knight and Trygg (1977b) suggested numerous factors—including land prices dependent on seller’s whims, site preparation costs, and capital costs—influence the feasibility of development on any given site such that an overall assessment of market strength is an inadequate measure of development potential around a transit investment. The application of such theories could lead to numerous false positives.

Market-related elements of New Starts evaluation criteria were found to be inconsistent with academic theory for these reasons. According to policy documents, a transit project’s rating could be improved based on development happening elsewhere in the same region, overall market growth, or demographic and employment projections for the corridor (theories 23, 24, 28, 32) (Federal Transit Administration Office of Planning 2013). Several practitioners also relied on these theories when explaining the factors that influence transit investments’ impacts on real estate development. In all cases, these theories do not appreciate geographic market differences in demand or site-specific feasibility of real estate development and could contribute to overestimates of development potential.

Furthermore, recent changes to the New Starts policies allow applicants to submit market analyses that consider the potential for different development types in the corridor (theory 27) (Federal Transit Administration Office of Planning 2013). While a potential improvement over more gross assessments of development potential, such analyses still fail to appreciate the unique circumstances that inform development on every piece of land. Market analysis of “development types” might suggest that rents could support projects of a certain scale and design in a submarket when the on-the-ground reality is that no sites are available where such development could feasibly occur. For example, development may be infeasible around a station in a highly desirable commercial district where all sites are occupied by productive land uses and land prices preclude economically feasible investments.

The New Starts policies and several interviewees also stated that evidence of developer interest, experience, or knowledge related to transit-oriented development was indicative of the likelihood

23 The theories discussed in this section can be found in Table 15.
of real estate development around new transit stations (theories 33-36). Additionally, New Starts policies reward applicants based on these metrics. However, these theories fail to appreciate the site-specific nature of development potential and the many necessary factors that must be addressed for real estate investments to be economically feasible. The application of such theories may contribute to outsized expectations for transit-oriented development.

Many of the theories stated by sources regarding the potential for changes to infrastructure, the expediting of transit-supportive project approvals, real estate project financial subsidies, and land use policy changes to enable real estate development were reflective of the academic literature. However, statements made by some sources suggested that addressing one of those factors in specific station areas was an indication of real estate development potential in that area (theories 38, 40, 45, 46, 55). This overgeneralizes theory found in the literature which recognizes that such factors may be necessary for development to occur but not sufficient. Depending on the context, an individual factor may not be a binding constraint such that addressing it makes development feasible. For example, no reasonable amount of financial subsidy may be able to alleviate certain physical constraints on development, such as seismic instability of land. Also, land use policies like zoning typically define the upper bounds on real estate development and are only constraining when developers can feasibly develop more than what policies allow.

In fact, the federal government’s New Starts evaluation language reflects this inconsistency in its formulation. New Starts evaluations consider each critical factor—such as infrastructure, land use policies, real estate market trends—independently and averages the scores such that a transit project could receive a low rating in a critical element and still garner a high overall score with regards to real estate development potential (Federal Transit Administration 2013b).

Reflecting the need to understand site-specific feasibility, practitioners did espouse theories regarding the ways characteristics of station area parcels inform development feasibility. However, many of their theories were oversimplified such that they might lead to false impressions about the potential for real estate development around transit stations (theories 48-52). For example, several transit planners suggested that they aligned transit stations with vacant parcels, brownfield sites, and underutilized parcels because such locations were imminently developable in all circumstances. Policy implementers explained that the presence of vacant parcels was also rewarded in the New Starts evaluations. However, the state of such properties may be indicative of the infeasibility of real estate development on those sites. Practitioners that considered large or consolidated parcels to be likely development sites also failed to appreciate the site-specific nature of real estate feasibility.

An under-appreciation of context was the primary insufficiency of many of the theories when compared to the academic literature. Notably, one of the only times that context was a consideration in federal policy related to real estate financial incentives. The language suggested that “not every financial incentive is relevant or appropriate to every [transit] project context” (Federal Transit Administration Office of Planning 2013, 22). In addition, the guidelines asked that applicants “explain the importance and need for these incentives” (ibid). However, of the factors mentioned in the policy—infrastructure, speed of approvals, or even market demand—the provision of financial incentives might be the factor least sensitive to context. For example, assuming no overriding factor like environmental limits on construction at a site, adequate financial subsidies can make development economically feasible and could even allow developers to internalize the costs of infrastructure, the financing costs associated with permitting delays, or market prices below the point of cost recovery. In addition, even in strong
markets where development is feasible without subsidies, subsidies can make development even more viable and more likely to be attractive to investors. On the other hand, new infrastructure, faster permit approvals, or other factors may not be binding constraints in some contexts and addressing any one of them may not alter site-specific development feasibility.

**Influence of transit-supportive plans and policies on real estate development**

Interviewees and policy documents frequently referred to the influential role of land use plans and policies in informing real estate development. In fact, the literature has also frequently pointed to the constraints that land use policies have placed on development in many station areas where market forces make real estate development an attractive investment option. In many instances, transit planners and policymakers’ theories regarding the influence of land use plans and policies on real estate development were consistent with theories described in the academic literature (theories 56, 61, 67, 68 in Table 16 above). However, a number of statements made by interviewees and found in policy documents, while resembling statements found in the academic literature, were actually inconsistent with scholarly research.

Interviewees discussed the potential for new transit-supportive land use plans and policies to allow, induce, or dictate real estate development around transit investments, notions also reflected in the New Starts policies. Some sources suggested that policies that allowed transit-supportive development would also make it more financially feasible (theory 58). For example, a transit planner in Charlotte described the “certainty” afforded to developers by the City’s TOD Zoning Districts and how that contributed to real estate development. However, as stated, the theory did not appreciate that land use policies may not be the binding constraint on site-specific development feasibility such that land use policies may have no influence on real estate development outcomes. For example, in locations where markets and infrastructure are suboptimal and subsidies are not available, allowing transit-supportive real estate development may have no impact on the amount of development that occurs.

Several sources suggested that land use plans and policies could encourage development. As one transit planner explained, “Zoning is merely a tool to get to what you want your city to look like.” A transit planner in Austin explained viewed upzoning and density bonuses as tools that could be used to encourage development. “In general, it’s my understanding that letting people develop more densely makes it more profitable and more likely to happen.” However, the literature suggests that mechanisms like upzoning, density bonuses, and New Urbanist land use policies—mechanisms that many sources suggested were policies that could encourage development (theories 59, 60, 62)—may not be effective in some locations and may even have a detrimental impact on real estate development feasibility in some instances. Upzoning and density bonuses are only valuable in contexts where building more provides economic benefit to real estate developers. As one Portland transit planner said during our interview and the academic literature has found, such policies can incentivize landowner speculation, raising land prices and actually reducing development feasibility (theory 61). The academic literature also suggests that New Urbanist policies are associated with higher development costs that may not be recouped through higher prices.

New Starts scoring criteria give higher scores based on the proportion of station areas where a transit-supportive land use plan and related policies have been adopted (Federal Transit

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24 The theories discussed in this section can be found in Table 16.
Administration Office of Planning 2013). In addition, the policies consider whether the transit-supportive policies require mixed-use zoning, enforce strict design guidelines, or set regulatory minimums (such as parking minimums) for development in station areas—all factors that may complicate real estate development. Policymakers also consider whether real estate development subsidies are available, a need that may be amplified by the other policies they advocate. However, New Starts policymakers may fail to appreciate the cost of implementing new infrastructure, beautifying areas, or granting financial subsidies to the extent required to build the projects described in many station area land use visions.

Sources’ theories regarding the ability of land use plans and policies to direct growth were also inconsistent with the academic literature (theories 63-66). For example, a transit planner in Dallas suggested that local land use planners were critical to transit projects’ success because they make development happen. In explaining his emphasis on the role of land use plans in generating transit-oriented development, a national transit planning consultant stated that “cities cannot control gas prices or downtown parking prices but they do control land use.” A transit planner in San Diego suggested that regional plans were able to “allocate” development to different parts of the region such that development would occur around proposed transit stations. However, the academic literature does not suggest that land use plans and policies mandate that landowners develop their properties or play any other direct role in delivering real estate development. Instead, the literature suggest that land use plans and policies can generally constrain development, perhaps leading to a redistribution of supply. Scholars also acknowledge that plans and policies may be relaxed in some locations where development is highly feasible, allowing development to occur. However, plans and policies generally do not address all of the factors that inform site-specific feasibility of real estate development such that they dictate development outcomes.

Many interviewees spoke of empirical evidence when I asked for clarification regarding their statements that land use policies encourage or direct real estate development. For example, numerous FTA staff people pointed to dense development in Arlington, Virginia, and along the Metro’s Red Line in Maryland as evidence of development unleashed by policy modifications around transit investments. In fact, several FTA staff had worked previously as planners in the wealthy northern Virginia suburbs of Washington D.C., where the relaxation of zoning codes, particularly lower density zoning codes, was often followed by real estate development. They extrapolated from those experiences that adopting similar land use policies would lead to development in other parts of the region. One interviewee suggested that the lack of development in nearby Prince Georges County could be attributed to the lack of timely and high-quality land use plans but not the weak market that existed in the area.

Inconsistent theories-of-practice and unrealistic real estate development expectations

The inconsistent theories stated by numerous interviewees may help explain what many transit professionals lamented during our conversations: that real estate development around transit investments they helped plan in a dozen regions fell short of their expectations. The evidence suggests that the issue could reside with the formulation of transit-oriented development expectations based on theories-of-practice that are inconsistent with the best available knowledge on the topic. To paraphrase Schon (1983), practice based on inadequate theories may be unable to fulfill the espoused purposes of a profession. In fact, a number of skeptical urban planning
scholars have suggested for some time that transit investments may not have the land use-shaping capabilities that practitioners and policymakers in the field often attribute to them (Webber 1976; Knight and Trygg 1977b; Giuliano 1995; Porter 1998; Kain 1999; Giuliano 2011).

All of my interviewees suggested that transit investments would contribute to Smart Growth urban development. However, several interviewees indicated that the quantity of real estate development around transit had failed to meet their expectations—even though the real estate development around the transit facilities they helped plan met their expectations for quality in many instances, often because local land use planning had clearly defined the types of projects that could be built. For example, several transit planners in Portland, Oregon, said that real estate development around their MAX light rail system had been high-quality TOD but the amount of development activity since the system opened in the mid-1980’s had fallen short of the regional government and transit agency’s expectations.

In several instances, I learned that the scale of planners’ expectations rested directly on their theories regarding the impacts of transit investments on real estate development. For example, a transit planner in Dallas explained that he was surprised when development failed to materialize around a transit station that had been subject of a major Transit Oriented Development plan. This spurred a discussion during our interview in which it became apparent that he understood that local land use plans and policies directed development because, in his experience, significant developments had occurred in diverse locations where plans had been implemented. He expected development would occur within a narrow window of time following the adoption of a plan and applied his expectations to any new transit station where plans were adopted.

A transit planner in Massachusetts explained that transit was a strong enough market-shaping force that an assessment of station area development potential need only consider what land use plans would accommodate in a station area to appreciate the amount of development that would occur. To understand the full development potential, one needed only to consider the maximum amount of development local citizens might allow. In other words, the maximum expected deviation from existing land use plans defined future growth potential. Therefore, his expectations for real estate development around the transit investments he planned rested firmly on local land use plans and the expectations of land use planners regarding future policy changes.

Another interviewee’s theory considered transit’s transformative potential and the pent up demand for real estate near transit. A planner in Salt Lake City described planning transit alignments to intersect with locations that local governments had identified for dense development in long range plans. When I asked more about his understanding of the influence of transit investments on real estate development, he explained that transit was an attractor for households and would only be greater in the future as the subset of the population that cared about transit access grew larger. He suggested that the demand was large enough that his transit agency could build transit to any of locations designated for dense development and real estate investors would respond to the pent up demand within a matter of a few years.

Many interviewees believed that transit investments universally spurred real estate development and land use plans encouraged or dictated real estate development. Despite the fact that their composite theories were based on two theories that were inconsistent with the literature, those interviewees were doubly sure that real estate development around transit stations was inevitable in most, if not all, station areas at a scale described in land use plans.
Practitioners’ views that real estate development is likely in most station areas may be reinforced by New Starts policies. As federal staff explained in interviews and as the New Starts policy language reflected, FTA evaluators look poorly on New Starts funding applicants that do not conduct land use planning around all of the stations of a proposed transit investment, suggesting real estate development at some scale is possible in all station areas.

In fact, the theories found in New Starts policy language and stated by FTA staff during our interviews may also lead them to have outsized expectations of real estate development around the facilities they fund. More than 35 years ago, Knight and Trygg (1977b) suggested that transit could spur real estate development and that federal policy should evaluate site-specific development feasibility to determine the potential for such land use impacts. Though many policymakers claimed that Knight and Trygg’s work was a primary source for New Starts policy concepts, the policy language did not incorporate some fundamental aspects of the research. Knight and Trygg’s study suggested that broader indicators of development potential, like those actually applied by the New Starts program, would fail to accurately predict real estate development around federally funded transit facilities. In their words, “Impact-potential assessment for proposed transit improvements should include site-specific evaluations of the effect of these factors, and such evaluations should include knowledgeable real estate development perspectives” (Knight and Trygg 1977b, 6).

The expectations of transit planning professionals regarding the quantity of real estate development also rested on temporal expectations. Numerous interviewees expected that transit-oriented development would coincide with or soon follow the opening of new transit services. In some cases, planners with such views explained that it had been a decade or more since a transit facility had opened and they feared the window of opportunity for development to occur at those stations had long passed. They had difficulty reconciling their theories-of-practice with the lack of development. One planner proposed that any shortfall might be explained by the unpredictability of market fundamentals in his region. Another planner suggested that a cultural problem existed such that his local marketplace had yet to appreciate the immense benefits that transit afforded them. However, their explanations did not sway them from reasserting that real estate development should occur around transit leading up to or following soon after service is opened.

In a handful of cases, interviewees said that the amount of development matched their expectations, though not because tremendous quantities of development had occurred. Most argued that transit-supportive real estate development was a long-term prospect. Many of the interviewees who were skeptical about the influence of transit or land use policies on real estate development in the near-term considered land use impacts to be likely under future conditions. For example, several planners described imminent economic circumstances informed by climate change and congested cities in which transit-oriented development would be a favored investment.

**The persistence of potentially problematic theories-of-practice**

Understanding the rationality that reinforces particular practices is a critical step in reforming problematic actions (Flyvbjerg, Landman, and Schram 2012). The evidence accumulated for this investigation, as well as academic literature on professional practice, suggests numerous possible reasons for the proliferation and persistence of theories-of-practice that are inconsistent with scholarship and could lead to outsized real estate development expectations.
Unfortunately, it is not entirely unexpected to learn that practitioners rely on oversimplified or decontextualized theories, even in the face of evidence from their own experience that contradicts the theories. Once a theory is adopted, humans tend to exhibit confirmation bias that favors their current beliefs and practices, and it is common for us to pursue numerous strategies to avoid the cognitive dissonance that arises when our preconceived notions conflict with reality (Festinger and Carlsmith 1959; Nickerson 1998). Argyris and Schön’s (1974) theoretical lens on everyday professional practice suggests that oversimplified theories of practice persist even when their inadequacy has been pinpointed.

“We value the constancy of our theories-in-use and our behavioral worlds. Hence, theories in use tend to be self-maintaining. We tend to adopt strategies to avoid perceiving that data do not fit, that behavioral reality is progressively diverging from one’s theory of it, that one’s theory is not testing out” (Argyris and Schon 1974, 32).

Theories of practice predict that practitioners are often so unreflective and tied to their ways of doing that they become ineffective (Fischler 2012). Research has found that practitioners suppress feedback and ignore evidence, even if it makes them more dysfunctional (Schon 1983; Schon 1990). Furthermore, the strength of professional discourses in defining practice norms can lead individuals to retain and perpetuate theories-of-practice long after they are shown to be ineffective. Flyvbjerg et al (2012) suggest that changing ineffective practice can be very difficult and may require bringing the practices to the broader public’s attention in ways that render them unacceptable, even shameful, in public discourse.

Additionally, literature on planning practice has also recognized that ineffectiveness on one level may not prevent a person from achieving higher order goals (Flyvbjerg, Bruzelius, and Rothengatter 2003). For example, failing to deliver a project within budget but winning an election or subsequent contract based on the project having been completed could be evidence for a completely rational individual to retain theories that are ineffective in one domain and repeat associated practices time and time again.

While this study was not designed specifically to investigate why certain real estate development-related theories persist in transit planning, in the remainder of this section, I propose hypotheses for future research. In particular, I rely on data collected in interviews to describe how the political economy of transit planning may explain why it could be rational for theories that contradict scholarly thought to be adopted in practice and normalized in policy language.

**Introduction of inconsistent theories**

It is not unusual or unexpected for theories-of-practice that are inconsistent with scholarly theories to emerge and co-exist with other theories (Argyris and Schon 1974; Schon 1983; Schon 1990). This section discusses some of the ways these real estate development-related theories-of-practice might have emerged.

First and foremost, it may be the case that the academic literature does not reflect reality and that practitioners, individuals who are closer to the phenomena than academics, espouse more accurate depictions of the real world. That said, evidence gathered in this investigation suggests that the inconsistent theories applied by practitioners have not worked for them in practice. Most saliently, several theories have led them to anticipate more station area real estate development than has come to fruition.
It is also the case that inconsistent theories-of-practice may arise due to extrapolation. The hasty generalization of empirical observations to one’s current practice is documented by existing theories of practice. Schon (1983, 138) suggests that practitioners often “see the unfamiliar, unique situation as both similar to and different from the familiar one, without at first being able to say similar or different with respect to what.” Using the familiar example as a metaphor, they apply their knowledge of practice—knowledge gained through prior practice, conference presentations, or even book learning—to the existing unique situation. According to Schon, practitioners do in their latest situation what was done in the other and set their expectations for results based on prior outcomes. In a practice community, particularly a community that prides itself on technical ability, such metaphors become norms or paradigms of practice (Kuhn 1977).

In fact, it may be the case that transit planners’ exposure to Smart Growth literature, particularly case studies of transit-served Smart Growth developments, provides some of the initial evidence from which they extrapolate. Interviewees’ interpretations of case study examples certainly reflected this notion. For example, when discussing the potential for transit-oriented development in their regions, transit planners in Los Angeles and Dallas referred to academics’ case studies of Hong Kong—a completely different urban environment—that they had read.

Another explanation of the existence and persistence of theories-of-practice that are inconsistent with academic literature is that academic theories often consider optimal circumstances, while practitioners must rely on theories and heuristics that they can reasonably deploy in real world, less-than-ideal situations. Transit planning is a complex undertaking. In fact, many academics recognize transit planning processes as complex problem spaces (Rittel and Webber 1973; K. A. Small 1999). Relatively simple theories-of-practice may have developed to make the work of transit planning and transit project evaluation tractable, a common feature of professional practice (Argyris and Schon 1974).

The espoused theories identified in the taxonomy reflect this notion of simplification. Interviewees’ statements frequently resembled concepts found in the literature but were often overgeneralized or oversimplified. Similarly, the practices corresponding to those theories were often simpler and more tractable than practices that would have responded to the nuanced academic theories. For example, the academic literature points to the need to conduct site-specific evaluations of real estate development potential when designing transit projects and allocating funding to various transit proposals (Knight and Trygg 1977b). However, some sources relied on theories that suggested transit-oriented development would be likely throughout all the station areas of a proposed alignment. Site-level evaluations of vast areas might encompass thousands of parcels, a relatively daunting task compared to employing simple assessments that rest on oversimplified academic theories.

In fact, it has been considered infeasible to execute the site-specific analyses advocated for in the academic literature. One FTA staff person suggested that the technology to carry out thorough site-specific evaluations of real estate development potential over wide station areas is currently unavailable, and manual evaluations of thousands of potential development parcels would be cost prohibitive. Thus, FTA evaluators look to land use plans and other indicators that are considered predictive of development at the scale they anticipate it will happen. It was only in FTA’s 2013 revisions to the New Starts policy that mention was made of financial proforma analysis of development feasibility (Federal Transit Administration 2013a), a common methodology employed by real estate professionals to evaluate development potential on a one-off, site-specific basis. An FTA staff person explained to me that such analyses were identified
as “optional” in the latest New Starts policy language because FTA was unaware of any means of carrying out the work at the scale of a transit corridor, let alone multiple corridor alternatives. However, he hoped that including mention of the option in the policy would spur the development of new approaches.

This approach contrasted with another option: conduct site-specific feasibility analyses for a sample of locations that are the most obvious candidates for real estate development. However, when I asked FTA staff about this possibility, they suggested that it was not implementable. For one, they considered it infeasible due to the scale of such an undertaking. According to one staff member’s understanding, an applicant submitting material for the average ten-station transit proposal would need to submit information on thousands of site-specific development opportunities that likely existed. When I proposed during follow-up interviews that applicants might pick the top dozen opportunities in each station area, staff suggested that would not be considered a valid representation of the immense potential they understood to exist around transit stations. More pertinent to this discussion, they expected such a proposal would be rejected by transit industry stakeholders that had grown accustomed to the level and type of work associated with the existing evaluations. In fact, several FTA staff explained that a more data-intensive evaluation process had been proposed in the 2007 timeframe but was rejected by transit industry stakeholders because of its complexity. FTA policymakers involved in the most recent policy revision process decided to retain the older policy language until their call for a robust proforma-based evaluation method could be developed.

Another way of making complex practice tractable is to rely on experts and their theories, thereby not expending the resources required to develop one’s own understanding of complex theories. Evidence from interviewees suggests that transit planning professionals may be introduced to real estate development-related theories-of-practice that are inconsistent with the academic literature by outside experts who espouse such theories.

While explaining the reasons they anticipated real estate development would occur around transit investments, several interviewees said that that they were not familiar with the fundamentals of real estate development economics. A transit planner in Dallas explained that transit professionals were generally not as knowledgeable about real estate as those in the development community and that if they were, they would likely move quickly into the private sector. Many interviewees were also unfamiliar with land use planning. As one transit planner trained in transportation engineering explained about the role of land use planning, “As one of these engineers, [I have] never quite understood how all these planning processes worked.”

Transit planners sometimes had access to real estate expertise within their organizations but relied on it infrequently, if ever. Speaking of the differences between the joint development and planning work conducted at Los Angeles Metro, one interviewee explained, “Joint development requires knowledge of appraisal, development finance, etc. It’s a real estate transaction and that’s not the same skill as a transit planner.” In spite of having “seasoned real estate managers” on staff, transit planners there considered it unremarkable that they interacted very little with the real estate team as they contemplated real estate development during system planning or investment planning.

Many transit planners also said that rather than rely on experts within their organizations (e.g., transit agencies’ real estate teams, regional planning agencies’ land use planners) or on real estate financers, developers, and advisors, they looked to local land use planners for any needed
real estate development expertise. A transit planner in the Phoenix area explained, “The City knows where the development interests are because they are very engaged in it […] and then that will inform how and where we locate the streetcar project in Tempe or any of our other light rail stations.” Likewise a transit planner in Los Angeles suggested of the local governments’ land use policies, “They’re usually pretty realistic. Most of the planners know the city they’re in.” In assuming that local land use policies would lead to development as described in local land use plans, interviewees in Austin, Portland, Dallas, and numerous other regions relied on the good judgment and efficacy of local land use planners when determining where routes and stations would be located.

Transit planning professionals also described relying on the expertise of planners associated with the New Urbanist planning movement in particular. For example, when asked why he considered the land use plans for downtown Fresno to be evidence of real estate development potential, one interviewee told me that the plans were credible depictions of the future because they had been developed by one of the founders of the Congress for the New Urbanism. Yet, as discussed in the literature review in Section A-1, researchers have found that some New Urbanist land use principles are inconsistent with empirical research and the implementation of New Urbanist land use policies can reduce the feasibility of real estate development by adding cost relative to standard land use policies.

Similar observations led to calls for cross-silo training of transit planners and targeted research on real estate development more than three decades ago. For example, Knight and Trygg observed that transit planners were woefully unaware of real estate development fundamentals when they conducted their study of transit’s land use impacts:

“Another area in which research is needed is the operation of the real estate development process, particularly with respect to the role of transit and other forces. In our work we were repeatedly struck by the extreme lack of communication and mutual understanding between transit planners and private-sector real estate interests. Research into the tools and decision-making processes within the real estate market would provide a valuable resource for planners. This should, in fact, lead to development of improved curricula for planners to eliminate this ignorance of the practical workings of the land development process.” (1977b, 207)

Finally, it may be the case that practitioners are relying on theories that appear oversimplified and decontextualized in the U.S. context today because their theories are based on notions of how they believe the world ought to work or how it could be expected to work in the future. Some of the evidence could support such an explanation, though no interviewee explicitly recognized this as his underlying logic. For example, several interviewees talked about the influence of transit investments in terms of enabling the type of Smart Growth urban development that should occur. Some transit planners explained the underperformance of real estate development around stations based on the fact that households in their area did not appreciate transit to the extent they should have. Any individual that tacitly based his theories on the way the world ought to work could appear to carry out his practices using theories that were oversimplified and decontextualized in our contemporary U.S. context.

Several interviewees also explained that their expectations for transit-oriented development were long-term, based on long-range expectations of economic circumstances informed by climate change and congested cities in which transit-oriented development would be the norm. Perhaps
interviewees were tacitly acting on the idea that transit plans or land use plans in development today, to be implemented in a number of years and resulting in infrastructure and buildings meant to last decades or centuries, would need to be based on rationales that would make sense under very different future conditions rather than the current context.

While they did not explicitly explain that their theories arose from visionary logic, several interviewees made statements that reflected the notion. For example, an interviewee in Los Angeles spoke of case studies of transit-oriented regions in Asia as proof of the potential for transit-oriented development around the facilities he planned. He pointed to Los Angeles’ forty-year old transit-oriented regional planning vision as an indication that Los Angeles’s urban development could one day resemble mega-cities like Hong Kong or Singapore. If he believed that he should be making transit planning decisions based on a future circumstance when Los Angeles’ urban development functioned like Hong Kong or Singapore, this would explain several of his theories-of-practice that appeared very out of step with the current reality. Similarly, an FTA staff member explained that he was motivated to work at FTA because it helped address the imminent climate changes issues that the country faced. Some of the theories he articulated, which were inconsistent with the literature, might make perfect sense under specific conditions that could arise due climate change, circumstances that are very different from those that exist in the United States today.

Forward-thinking individuals who base their planning theories-of-practice on a future context may ultimately be seen as prescient. However, at this time, forward-looking theories would appear inconsistent with academic research that has typically rested on observations of recent events. Also, these forward-looking theories could lead visionary practitioners to inaccurately estimate the potential for transit-oriented development if U.S. conditions do not match those that the practitioners anticipate.

Perpetuation through power dynamics and economic incentives

While there may be a number of reasons that potentially problematic theories are introduced into practice, how is it that they come to be so widespread? Academic theories suggest that power dynamics and rent seeking can play a role in perpetuating theories and methodologies that practitioners employ when planning and evaluating major infrastructure projects (Flyvbjerg, Bruzelius, and Rothengatter 2003; Chen 2007). Evidence from my interviews suggests that power dynamics at multiple scales may play a role in perpetuating theories-of-practice that are inconsistent with the academic literature on the topic.

Numerous influential parties believe in the power of transit to change urban form

Interview evidence suggested that transit planners often based their consideration of real estate development on input from other individuals who suggested to them that transit investments could inform certain development opportunities. In addition, many interviewees suggested that various transit project stakeholders had become political advocates of the real estate development-related design elements that they had proposed as transit planners. In many instances, transit planners described the power dynamics that either kept them from pursuing designs that would promote real estate development or helped them implement design elements that they believed would promote real estate development.

Based on my interviews, I found that real estate development-related designs had been promoted by five categories of stakeholders: Landowners or developers, local government or
redevelopment agency staff, state or regional agency staff (frequently involved in system planning), local leaders (politicians, agency boards, local advocacy groups), and the transit agency staff and transit planning consultants themselves. This evidence also supported the notion of the existence of a broader discourse on transit’s role in spurring Smart Growth development. In addition, it reinforced the notion that transit planners act within an institutional structure where other individuals and organizations strongly influence their practices.

**Misalignment of land use planners’ incentives**

Based on my interviews, land use planners appeared to play a significant role in informing the real estate development expectations of transit planners. Some transit planners looked to land use plans as realistic visions of what would occur around a transit investment. Others explained that they had actually been engaged in the land use planning process by local land use planners. In many of those cases, the local land use planners had incentive to convince transit planners to modify transit planning processes and project designs.

Doing so was made easier by the fact that land use planners and the local governments they served often expended no money to add transit stations, move transit stations up or down an alignment, or reroute entire transit projects. While they did expend time, political capital, and relatively modest resources on land use planning—a fact of their everyday professional roles—they typically did not expend funds on the real estate development-related aspects of transit projects. Instead, those fell on the transit agency, regional government, federal government, and other transit project funders.

This misalignment of incentives may lead land use planners to oversell the effectiveness of land use plans to transit planners in an effort to promote transit project elements they find beneficial for their interests—for example, transit planners suggested that in several instances local planners had urged them to shift a transit station to be closer to their constituencies or to add a transit station to serve their jurisdiction based on real estate development expectations. If local planners did oversell the effectiveness of land use planning during the process, their logic may have been adopted by transit planners and revealed in the theories they subsequently shared during our interviews. Reflecting this possibility, many interviewees suggested that land use plans had the ability to encourage and even direct real estate development to occur. This study did not investigate this phenomenon directly though it could be the subject of future research.

**Garnering the support of local elected officials for transit investments**

Transit planners might come to expect outsized real estate development potential because they rely on transit-spurred real estate development to encourage local support of transit investments and rely on land use plans as indicators of that development. A transit planning and TOD consultant who had worked in more than five regions over the course of 30 years said that the lack of consideration of economic feasibility in most assessments of real estate development around proposed transit stations resulted from an alignment of incentives between transit planners, local land use planners, and local politicians.

He explained that the job of a transit planner was to build transit projects—and that required convincing local politicians and citizens that a proposed investment would have more positive than negative impacts on local communities. In particular, “the construction and implementation of transit improvements are sold on the idea that they can transform the community.” He found that most transit planners did not have a deep understanding of local real estate development
potential and typically relied on local land use plans to determine what might occur around proposed stations. He suggested that transit planners who relied on land use plans to determine the potential for transit-oriented development were both respecting local prerogatives and conforming to the policies set forth by federal transit funders.\(^{25}\)

On the other hand, he explained, it was the job of local politicians to deliver benefits to their constituents. With regard to transit projects, those benefits might come in the form of transit access, economic development, real estate that served local needs, or increases in tax rolls that could fund other benefits. Their motivation was to be re-elected to office or be elected to higher office. This transit professional suggested that because politicians tend to serve in office for four or eight years at the local level, they typically support initiatives that yield near term benefits. Some astute politicians promise grand results in the distant future, a timeframe that allows them to claim credit if results are good or deny responsibility if they are bad. “Very few politicians are looking 10 years out or 20 years out. They're not even going to be around in that period of time. That's just the reality of political context in which you're operating.”

Because politicians are swayed by near-term, large-scale impacts and local land use planners must earn these politicians’ approval, he suggested that land use plans are infrequently grounded in economic reality. “If you dealt with the reality, it wouldn't be very exciting, quite honestly.” Further, land use planning processes are generally highly participatory and seek input from local stakeholders, leading to “grand visions” that are not feasible but do garner political support.\(^{26}\)

He suggested that local land use planners and politicians were motivated to let constituents and transit planners believe the positive impacts would happen sooner rather than later. “If you go to the community and you say, ‘Look, nothing's going to happen around here for 20 years,’ that's just not a very exciting message. I just think that both the professional perspective and the political expectations of planning are such that it's just difficult to add that level of realism.” The transit planners, reliant on local land use planners to define real estate development expectations, come to expect that transit-oriented development is imminent.

Though he suggested that many transit planners believe that land use plans are indicative of real estate development potential around transit, when I inquired about his general belief in the ability of transit-supportive land use plans to result in significant real estate development, he responded, “I don’t believe in Santa Claus.”

**Garnering transit funding based on decontextualized case studies**

Transit planners may rely on decontextualized notions because they have helped transit planners successfully build transit projects. Another transit planning consultant with more than 30 years of experience working with transit agencies nationwide suggested that many transit planners he worked with relied on decontextualized case studies to inform their understanding of transit-oriented development. In fact, over the course of my interviews, I noticed that a set of unique cases of transit-oriented development were mentioned by a diverse set of practitioners. They included Mockingbird Station in Dallas, Texas; Fruitvale Transit Village in Oakland, California; New Starts policies focus heavily on land use plans and policies, do not require applicants to consider project-level economic feasibility of those plans and policies, and do not ask applicants to differentiate between near-term versus long-term real estate development expectations.

\(^{25}\) New Starts policies score applicants on whether or not local land use plans were developed in a highly participatory manner.
and the Rosslyn-Ballston Corridor in Arlington, Virginia. The planning consultant suggested that such evidence has allowed transit planning professionals to successfully convince people—including themselves—that real estate development will occur around the rail stations they plan.

He believed that case studies of development in Portland, Oregon—particularly real estate development served by a modern streetcar rail line in the Pearl District—were most frequently cited by transit planners in other cities as evidence that development would occur around their rail transit investments. However, he suggested that the Pearl District’s rail transit provided little, if any, accessibility benefits and compared it to “a Disney ride.” He argued that the area’s development was primarily the result of a unique land ownership situation, major redevelopment agency subsidies provided to developers, an extremely hot real estate market, and major quality-of-life investments made by the city government.

He argued that such examples were often presented without adequate context and most people were unaware of details of the Pearl District’s development beyond the investment in a streetcar facility. He suggested that the transit industry has found success using such cases to argue that transit is a “magic bullet” for revitalizing areas.

“A lot of [people considering transit investments] simply believe that if there is a quarter that is depressed, that infrastructure like a streetcar is going to have this phenomenal effect on developers. Developers are going to see that the city has made a commitment to the area, and they are going to buy up the land and start developing in anticipation of other development. This is a religion. This isn't based on a lot of evidence.”

He suggested that a belief in transit investments’ ability to single handedly spur development has proliferated industry-wide and squelched discussion of other factors that contribute to Smart Growth urban development. “Light rail is not going to foster economic development in and of itself. This is the cause and effect thing. What you have to do if you want to do a light rail project [and see real estate development] is you have to do all this other stuff—incentives, zoning, all the other stuff.”

He suggested that the argument was self-serving for numerous constituencies that benefited from rail transit construction. It helped the engineering, construction, and manufacturing industries build expensive rail projects rather than less costly bus projects; it helped the nostalgic rail fan community promote more projects; it helped transit agencies grow and claim greater job impacts in their regions; it helped numerous political entities claim they captured federal dollars; and it helped local politicians claim “world city” status. He argued, “The politicians and the business community are behind [rail projects] for the same reason they like to see football stadiums and baseball stadiums and convention centers.”

He also indicated that the industry’s attention turned to more inexpensive light rail transit after the federal government determined that the costs of several heavy rail systems built in the 1960s and 1970s were too great relative to the ridership. However, the industry found that it was difficult to justify light rail on the same basis as the earlier grade-separated, heavy rail projects that had cherry-picked some of the best routes in the United States and provided exceptionally fast and reliable service. Relative to those projects, he suggested that “major light rail systems don't offer the kind of increases in ridership and accessibility.” Thus, transit project proponents began to focus on the real estate development benefits that were more difficult to predict than ridership and costs.
He suggested that one has to consider transit’s direct impact on real estate development more skeptically. For example, he has seen research that used ratios of improvement value to land value to determine if a piece of property near transit was underutilized. “That's an indication of whether it's developable.” He also believed that the qualitative analysis employed by the New Starts program—evaluating plans and policies—was a valid way of determining if a transit proposal had helped generate the political will to support real estate development around transit projects. He suggested that any analytical method was more useful and less troubling than believing in the “build it and they will come” philosophy perpetuated by decontextualized case studies of transit-oriented development.

**Maintaining federal funding programs**

New Starts policy documents include theories that are inconsistent with the academic literature. Federal policymakers and policy implementers’ statements revealed three compelling explanations for their inclusion. First, some interviewees did not realize they were inconsistent. Second, some interviewees were aware that they were inconsistent but said that they had relied on simpler theories because they were more feasible to implement in practice. Lastly, interviewees who contributed to the original policy formulation suggested that the political economy of federal transit funding defined the theories that were included.

New Starts policymakers may have established and retained highly subjective evaluation measures of transit-oriented development potential to increase the odds that transit projects that would not be funded on their transportation merits alone, for example, projects in less dense regions where initial ridership would not justify the capital costs, might still win funding through the merit-based grant making process. The incentive for policymakers to find ways to fund such projects was to achieve greater geographic equity and garner political support for federal transit funding programs from more congressional districts.

In the late 1970s, it was widely appreciated that heavy rail transit systems were inefficient expenditures relative to bus transit services, and the continuation of federal transit funding came under intense scrutiny (Altshuler and Luberoff 2003). Speaking to the political environment at the time, both Orski (1980) and Knight (1980) suggested that new rail transit project sponsors could not justify projects’ high capital costs in transportation terms alone and had to demonstrate a positive impact on real estate development patterns to remain politically relevant to a congressional majority.

In response to a threat to eliminate transit funding in the early 1980s, an FTA staff person explained that a small team worked on short notice and around the clock for one week to produce an “apolitical,” merit-based transit project evaluation process that was part of a compromise deal to raise the gas tax and maintain transit funding during the Reagan administration. As a policymaker explained, real estate development around transit was one of the positive qualitative considerations that the team chose to include in policy’s laudatory language. The staff included several subjective measures—like prospective real estate development—to insure that bureaucrats could offer a geographically equitable distribution of funds, not just where transit investments would be most efficient. As explained by one of the policy’s authors, “Funding can't all go to New York, even though the numbers say it should.” Policymakers were highly motivated to maintain a congressional constituency for the threatened transit program.
Perpetuation through discourse

The ubiquity of interviewees’ statements about the role of transit in fostering Smart Growth urban development suggested that a dominant discourse had formed regarding the transformative powers of transit investments. Such discourse could have perpetuated theories that were inconsistent with the academic literature. In this section, I discuss several academic theories regarding the perpetuation of theories through discourse.

One way that that discourse could take hold is through the professional definitions of transit planners. In keeping with academic theories that suggest professionalization is a process of exercising social control over specified areas of expertise and aspiring to the ideological self-image shared by the expert group (Eraut 1994), it may be the case that many transit planning professionals subscribe to an idealized vision of their professional roles and rely on theories, however inconsistent, that preserve that self-image. Many practitioners that I interviewed perceived themselves as experts who helped achieve Smart Growth urban development. For example, one FTA staff person defined Smart Growth as his mission within the agency. “I care about transit-oriented development and I care about cities and how they can transform themselves with transit, making themselves more compact, more urban—real cities like we know cities should be.” To uphold that image in places where transit investments are unlikely to have a significant influence on urban development, practitioners may rely on theories that are inconsistent with the academic literature.

Similarly, it may be the case that transit planners are part of a practice community where repetitive exposure to particular theories has led to their adoption as practice norms and philosophies. This is consistent with discourse-based theories about communities defined by shared meanings and frames.27 The fact that transit planners espoused diverse theories regarding the causal pathways of transit investments’ impacts on real estate development but reached the same overall conclusion regarding transit investments’ contribution to Smart Growth urban development suggested that practitioners had identified rationales that allowed them to synchronize their own knowledge and experiences with a prevailing discourse. As Cervero (2002, 1) pointed out a decade ago, “it has become doctrine that integration of [transportation and land use] is crucial, requisite for good planning practice.”

Additionally, public policies tend to simultaneously reflect and perpetuate dominant discourses (Yanow 2000). Federal policymakers suggested that they were thinking about Smart Growth-style development as they contemplated the land use elements of the New Starts policy in the mid-1990’s. In fact, several individuals with Smart Growth credentials were invited by FTA to join policy framing discussions when the original land use policy language was developed (Dunphy 1993). As a case in point, one transit planner referred to the New Starts evaluation criteria as “another Smart Growth checklist” during our interview. The fact that the New Starts policies include numerous theories that were found to be inconsistent with the literature suggests that they may have been acceptable because they were part of a dominant discourse. In addition, because of the heavy reliance on New Starts funding, FTA policy implementers interact with nearly every major transit investment in the United States and the New Starts policies provide a

27 “Through a process of interaction, members of a community—whether a community of scientists or environmentalists or some other group—come to use the same or similar cognitive mechanisms, engage in the same or similar acts, and use the same or similar language to talk about thought and action. Group processes reinforce these, often promoting internal cohesion as an identity marker with respect to other communities: the familiar ‘us-them’ phenomenon.” (Yanow 2000, 10)
national platform for disseminating and validating various transit planning practices, including inconsistent theories.

The prevalence of inconsistent theories across transit planning practice

This study’s evidence also indicates that inconsistent theories may be used widely in U.S. transit planning practice. Looking back at Table 9 in Part B, transit planners explained the goals of their real estate development-related transit planning actions in ways that reflect many of the theories that I found to be inconsistent with the literature. For example, as they explained their actions, interviewees said that they were actively trying to support growth identified in regional in local land use plans, were locating transit infrastructure near brownfields and vacant properties, were supporting Smart Growth efforts, and were responding to the New Starts scoring criteria—all efforts relevant to theories-of-practice that could contribute to overestimates of the potential for transit-oriented development. In all 18 of the regions where this study found real estate development-related transit planning practices had occurred, transit planners appear to have modified transit planning processes and project designs based on such theories. That said, the data collection for Part B was based on a snowball sampling technique and cannot be considered representative of all transit planning processes. Follow-up research considering a representative sample of transit plans could seek to understand how often inconsistent theories actually play a role in transit planning.
Conclusion

Prior to this study, no research had investigated the influence of real estate development considerations on transit project planning practices, particularly whether transit planners purposefully located alignments and stations where real estate development was economically feasible as described in the literature. This study relied on evidence from interviews with nearly 100 planners, document review, and participant observation to examine how and why real estate development considerations influence transit project planning.

Transit planners have modified the transit planning processes and project designs of billions of dollars of transit investments in numerous and costly ways to promote Smart Growth urban development. These findings suggest that there may have been a paradigm shift in transit planning since the mid-1990’s, when planning scholars considered transit and land use coordination to be an atypical undertaking (e.g., Cervero and Landis 1995). Rather, transit and real estate development coordination has long been a cornerstone of many transit professionals’ practices and many transit plans have been produced with real estate development front of mind.

As discussed in Part B, according to interviews with more than 60 transit professionals, system plans, transit alignments, station locations, and station area designs have been adapted to promote real estate development in regions throughout the country. In fact, many transit planners discussed projects that were inspired first and foremost by their potential to encourage Smart Growth urban development—rather than for a particular transportation purpose—and set out to optimize transit projects’ designs to promote real estate development. In addition, Smart Growth land use planning around stations is now considered a commonplace aspect of integrated transit and land use planning, so much so that FTA project evaluators thought of station area land use plans as trite evidence when cited by New Starts funding applicants.

Classic criticisms of poor cost and ridership forecasts once called into question the efficiency of transit investments (Gomez-Ibanez 1985; Johnston et al. 1988; Wachs 1989; Kain 1990; Pickrell 1992; Taylor and Samples 2002; Flyvbjerg, Bruzelius, and Rothengatter 2003; Chen 2007). However, this research raises questions about the current efficacy of real estate development-inspired transit planning and the efficiency of transit investment decisions that are based on current evaluations of the potential for transit-oriented development. As discussed in Part B, several interviewees lamented that their real estate development-inspired transit planning efforts had not resulted in the anticipated real estate development around transit stations. Based on three transit project case studies, I found that real estate development that had inspired costly aspects of transit planning processes and project designs had not resulted in all of the transit-oriented development-related ridership or societal benefits that had inspired transit planners to expend the resources.

As discussed in Part C, I found evidence that helps explain why transit planners’ expectations for transit-oriented development exceeded reality. Through interpretive analysis of interviews with nearly 100 transit professionals—including transit planners, federal policymakers, and federal policy implementers—and a review of federal policy documents from the New Starts program, I developed a taxonomy of transit professionals’ theories. I found that many were oversimplified and decontextualized versions of academic theories. Academic literature suggests that there are many factors that can constrain real estate development, and that the potential for real estate development must be measured in a particular context at a site-specific scale. As stated, planners and federal grant-makers applying the theories in practice would reach the logical conclusion
that transit-oriented development was likely around many, if not all, proposed transit stations. Such theories help explain why transit planners’ transit-oriented development expectations were not met in spite of their best efforts to optimize transit plans in support of such development. The interviews suggest that the application of inconsistent theories likely informed real estate development-related transit planning across the 18 U.S. regions covered by this study.

These findings suggest that, at least in some cases, significant funds are being expended on elements of transit project implementation—such as transit project design elements, station area land use planning processes—that will not yield the expected development-related benefits. Furthermore, it suggests that scarce transit funding has been allocated to projects that do not perform as expected. Such inefficiency may result in significant opportunity costs sustained directly by governments, transit agencies, private investors, and citizens.

Based on these findings, I recommend that additional research be carried out to understand the actual scope of the inefficiencies. I also recommend steps that may help improve the efficiency of transit planning practices. The following sections elaborate upon these recommendations.

**Understanding the scope of transit planning inefficiencies**

This investigation’s interview evidence revealed that real estate development-inspired transit planning was prevalent across the regions where my interviewees had planned projects (Part B). In addition, my case study research found that transit planners were inspired to institute costly planning process and infrastructure changes based on expectations for transit-oriented development that did not come to fruition. As previously stated, future research is needed to determine the magnitude of the inefficiencies at the project scale and across projects.

Follow-up research could determine the actual costs and benefits of real estate development-related transit planning practices. This study found evidence that the costs could be relatively large, as in the case of the Interstate MAX alignment choice in Portland, OR, or relatively small, as in the case of stations aligned with particular cross streets where development was anticipated in Charlotte, NC (see case studies in Part B). Additionally, the transit-oriented development benefits that have accrued around transit projects have not been thoroughly measured. Follow-up research could assess the costs and benefits across a representative sample of transit projects to better understand the overall scope of the impacts that real estate development-related transit planning practices have in the United States. Over the long term, researchers could survey transit professionals about their expectations for real estate development in advance of project delivery and compare that to data on actual real estate development outcomes, a data set that does not exist at this time.28

In particular, the timing of expected versus actual real estate development benefits should be better understood. In this study, transit planners typically suggested that they expected the benefits to accrue leading up to or following soon after a transit investment opened. However, when asked about the effectiveness of their real estate development-related interventions that had not yet yielded results, they frequently stated that their efforts were worthwhile because they

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28 Currently, FTA conducts ex ante and ex post evaluations of project costs and ridership only. “The law also requires that FTA evaluate the performance of the projects funded through the New Starts program in meeting ridership and cost estimates two years after they are opened for service, through implementation of a ‘Before and After’ study requirement. This also helps to evaluate the success of the grant program itself for purposes of the Government Performance and Results Act.” (Federal Transit Administration 2013a, 2029)
would help generate the real estate development eventually. This suggests that the timing of impacts is not a prime concern of practitioners, though it is an important element of benefit-cost analyses. Such lines of inquiry could also consider the implementation of the real estate development-related New Starts policies in particular and contribute to the existing literature on mega-project funding issues (Flyvbjerg 2009).

Begin to address inefficiencies through policy changes

New Starts policies may perpetuate some of the inefficient practices identified in this study by normalizing a set of theories-of-practice that may contribute to overestimates of the potential for transit-oriented development (Part C). Ultimately, the current policies and their implementation may lead FTA to prioritize funding for proposed projects that do not achieve as many real estate development-related benefits as expected. Changes to the policies could allow project sponsors and federal evaluators to consider real estate development potential more accurately and lead to a more efficient allocation of resources.

Existing policies may lead to inefficiency for a number of reasons. For example, in spite of research that has found a number of factors are simultaneously necessary for transit-oriented development to occur, the federal government’s New Starts evaluation language considers each factor—such as infrastructure, planning, real estate market trends—individually and averages the scores such that a transit project could receive a low rating in a critical element and still garner a high overall score with regards to development potential.

Similarly, interviews with policy implementers and a review of FTA’s policy guidance suggested that New Starts evaluations rely on evidence of real estate development potential over wide geographies—such as regional market metrics and regional development trends—whereas the academic literature suggests that real estate development potential is site-specific. In fact, Knight and Trygg (1977b, 6) specifically called for federal grant-making to consider “site-specific evaluations” of real estate development feasibility around proposed stations.

Interviews with policymakers and policy implementers suggest that implementation of the New Starts policies has not distinguished between anticipated near-term real estate impacts and very long-term impacts. FTA staff suggested that they expect to differentiate between projects that are more or less likely to generate land use impacts by evaluating land use plans and policies, but only “aspire” to differentiate between transit projects that will have near-term land use impacts and those that will have long term impacts. The default treatment was to assume all real estate development benefits, even those that planners thought were likely only on the distant horizon, would accrue in the near-term.

While recognizing the current technical capacities of project sponsors and grant application reviewers, I suggest that FTA require transit project sponsors to identify the particular parcels where they anticipate development will occur within a brief timeframe (for example, within five years of the commencement of transit operations), describe the development they anticipate, and provide a justification for their assertions. FTA could then provide the materials to a panel of real estate professionals who would judge the validity of the assertions. If the number of sites under evaluation are found to be overly taxing on either applicants or evaluators, a specific number of sites, say the top 10 per station area, might be sufficient to differentiate transit project proposals according to their real estate development potential.
My suggestion includes adopting a relatively near-term timeframe for these projections. As noted in the taxonomy of theories, even interviewees who were skeptical of many near-term real estate development impacts of transit investments still believed that they were feasible in the long-term. It is conceivable that such long-term changes could be accounted for probabilistically in a standard benefit-cost framework that would discount future benefits and costs to their present value. However, such complexity could add error to any estimates and would likely be an unwelcome addition to the FTA’s process for both project sponsors and grant application reviewers who already consider the current process overly burdensome. Therefore, conducting relatively near-term projections may be a more viable option.

Additionally, by focusing on a relatively near-term time horizon, one might expect that future conditions will be relatively close to current conditions, making projections more realistic. This is a notion expressed by FTA as they explained why they now allow funding applicants to produce 10-year ridership projections rather than the standard 20-year forecasts (Federal Transit Administration 2013a). Additionally, relatively short time horizons would allow for ex post evaluations to be conducted. Such performance evaluations could be used to hold transit planners and project sponsors accountable for achieving real estate development-related project goals, impacting project sponsors’ reputations and thus mitigating optimism bias among forecasters. Additionally, ex ante projections and ex post evaluations could also serve as valuable instruments for future academic research.

**Fill several gaps that exist between research and practice**

While this study found that many theories-of-practice stated by sources matched the scholarly literature, a majority of the theories-of-practice identified in the taxonomy were found to be in conflict with or oversimplifications of theories found in the scholarly literature (Part C). In addition, the taxonomy identifies several theories that were not yet found in the literature and did not conflict with existing scholarly thought. The fact that an espoused theory was not discussed in the literature is not a comment on its validity or its value to professionals. Schon (1983) sought to understand how professional knowledge was like and unlike the kinds of knowledge presented in academic textbooks, scientific papers, and learned journals as an avenue for enhancing both practitioners’ and scholars’ theories. Several of the theories that practitioners articulated may provide interesting avenues for future scholarly research.

One promising avenue for research relates to regional growth trends. Interviewees suggested that the recent development of real estate projects in particular parts of the region would be predictive of future development in those same areas. As discussed in transit project case studies, planners in Charlotte and Dallas acted on this theory as they aligned major transit investments with radial corridors that were experiencing a disproportionate share of the regions’ real estate development activity. This is similar to the sector theory described by Hoyt (1933) and the notion of the favored corridor popularized by Leinberger (2008), yet there have been no modern empirical studies to determine whether real estate development occurring along radial axes is predictive of future growth along the same axes.

A second avenue for research relates to the notion expressed by several sources that existing development styles are predictive of the type of development that will be financially feasible in the future. As planners explained, pre-existing mixed-use development proximate to proposed transit facilities was considered predictive of the potential for future transit-supportive development in those same areas. Based on this logic, planners sought to locate stations near
existing dense, mixed-use urban areas not only because of immediate ridership implications but also because of the incremental ridership from additional mixed-use development in the future. I am not aware of any scholarship that has investigated this premise to date.

Another avenue for future research relates to the role of accessibility provided by non-transit modes in influencing the realization of transit-supportive development. Interviewees suggested that they focused on levels of automobile access to station area parcels when assessing the potential for transit-oriented development. However, current scholarship focuses on the role of transit access in spurring real estate development around new transit facilities. Though many studies of land value impacts around transit do control for highway access, research on transit-oriented development has not specifically considered how roadway access influences real estate development around transit.

**Understand why gaps exist between scholarly theories and practice**

If it is found that the inefficiencies of real estate development-related transit planning practice are large, researchers should interrogate the root causes that explain the gap between research and practice. As exemplified by the discussion of potential policy changes above, there may be opportunities to reduce the gap between some of the transit planning knowledge currently employed in practice and the theory described in academic literature. However, for potential policy changes to influence practice, one must assume that the New Starts policies inform practice—which this dissertation research found was not occurring widely today.29 To truly influence real estate development-related transit planning practices, we must first understand why the gap exists between research and practice.

Notably, several interviewees alerted me to the fact that the dominant theories espoused by their peers were problematic and contrary to the academic literature. How is it that inconsistent theories develop, disseminate, and perpetuate in spite of sub-groups in the industry recognizing potential shortcomings?

As discussed in Part C, I found evidence that both the political economy of transit investment and the discourses that define the transit planning profession may contribute to the persistence of inconsistent theories. Future studies could examine evidence that I gathered from interviewees regarding the numerous interests that inform transit investment decision-making. For example, interviewees suggested that inconsistent theories were pertinent to winning the political support of local officials or were critical to maintaining congressional support for federal transit funding. Future research could also explore the impacts of the broader Smart Growth discourse that was ubiquitous in my evidence. For example, some interviewees suggested that their professional identity was defined by transit’s ability to inform Smart Growth urban development, while others pointed to the inculcation of Smart Growth principles into the New Starts policies.

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29 The original hypotheses tested by this research were related to the impact of the real estate development-related elements of the New Starts policies on transit planning practices. However, it was found that the New Starts policies were merely reflective of a much larger discourse on transit’s relationship to Smart Growth urban development that permeated both policy and practice. Several interviewees did provide evidence that the real estate development-related New Starts policies influenced transit planning processes and project designs, but this was a relatively rare occurrence. There was greater evidence that the policies reinforced other theories and practices rather than directly defining transit planning practices. The evidence gathered for this research could not say with certainty that changes to the New Starts policies would have widespread influence on the practices of transit planners.
Reduce the gap between research and practice

Though future studies will need to investigate how one might optimally go about effectively reducing the gap between research and practice, the evidence gathered for this study helped me identify initial recommendations for doing so. I believe that researchers can increase their exactitude when communicating findings, disseminate case studies that highlight the complexity and context specificity of transit-oriented development, and conduct reflective practice research.

With regard to academic rigor, this study points to a need for those in the academy to more clearly communicate theories and research findings such that practitioners can more easily interpret and apply the insights expressed in the literature. This would include thoroughly contextualizing and caveating statements. As discussed in Part C, the study highlights the tendency of transit professionals to lean heavily on academic theories but to misinterpret them in the process. In some regards, this may be a function of confirmation bias and overcoming cognitive dissonance on the part of transit professionals—aspects that may not be addressed through academics’ efforts. However, if academics could make their findings more clear, more explicitly identify caveats, and preempt the misappropriation of insights in some cases, then it seems imperative that they do so.

As the evidence in Part C reveals, many theories espoused by transit planning professionals were inconsistent with scholarly findings because they did not appreciate the interrelation of factors and the importance of context that inform real estate development feasibility. As one means of making this clear to practitioners, researchers can produce and disseminate case studies of transit-oriented development that highlight those aspects of transit-oriented development. During my interviews, transit planners relied heavily on case studies to support their statements. Additionally, one interviewee’s discussion of the persistence of inconsistent theories focused on practitioners’ adoption of particular cases to inform practices nationwide. I hypothesize that more in-depth versions of these case studies in particular could help inform some practitioners’ understanding of real estate development around transit.

Finally, researchers can engage transit professionals in reflective studies that address the theories-of-practice that inform inefficient practices. Per Schon’s (1990) conception of reflective practice, reflective research can be conducted with practitioner co-investigators as an effective means of informing their practices going forward. Whereas policy prescriptions and other policy changes often fail to alter institutional norms, reflective practice has been shown to be a fundamental form of professional learning. As a starting point for such work, researchers could work alongside transit planners to understand their real estate development expectations. Researchers could also reflect with planners on their prior work, much as I did in interviews, through over much longer reflective discussions (see Forester (1992) as an example). If researchers have opportunities to engage with practitioners over longer periods, both groups could work to understand their transit-oriented development expectations in advance of a transit investment, review the actual outcomes, and identify the potential causes of any discrepancies (See Krumholz and Forester (1990) as an example of deep engagement).

There is much that can be done. This study of transit planning in the age of transit-oriented development has explored the tip of the iceberg. Studies such as these serve to evaluate the progress that transit planning has made in achieving transportation and land use coordination goals. In doing so, I have been able to highlight some inefficiencies in relevant transit planning practices that are deserving of further study so that planners might improve their effectiveness and fulfill the objectives they set for their practice.


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Appendix A: New Starts policy overview

One of the original motivations for this study was to understand how the real estate development-related components of the FTA’s New Starts grant-making evaluation process (the NSRED policy) might have influenced the calculus of transit planning and project design. Therefore, substantial evidence was gathered on the policy, its development, and its implementation. In addition, evidence was gathered on people’s reflections on those same three activities. Overall, the policy was found to have a small direct influence on transit planning processes and project designs but served to promote a certain discourse and set of transit planning norms. This included the notion that transit investments are critical precursors to Smart Growth urban development and that land use plans play an important role in influencing real estate development outcomes in transit station areas. In this appendix, I provide a brief overview of the policy and its real estate development-related criteria.

Projecting the potential for real estate development around transit is particularly relevant to economic benefit forecasts for transit investments and can differentiate between two otherwise similar transit projects. The U.S. Federal government is one party particularly interested in optimizing the billions of dollars they invest annually in transit projects, evaluating requests for the New Starts program’s construction grants based in part on the prospects for transit-supportive land use impacts around proposed transit projects (Federal Transit Administration 2013a). Title III of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) required the Federal Transit Administration (FTA) to consider “transit supportive land use policies and future [land use] patterns” as part of New Starts grant-making evaluation criteria (U.S. Congress 1991).

Following the enactment of ISTEA and after a review of critical pieces of the literature, particularly work by Knight and Trygg and several rail evaluation studies, initial policy language was proposed in 1994 (Federal Transit Administration 1994b).30 Following public input and deliberation by FTA staff and experts, the Transit-Supportive Land Use criterion was adopted in 1997 for the evaluation of the 1999 New Starts awards (Federal Transit Administration Office of Planning 2004). The policy language has remained stable over time and focuses on the potential for real estate development around federally funded transit investments (Federal Transit Administration 2013b).31 After much study, the Transit-Supportive Land Use criterion was adopted in 1997 for the evaluation of the 1999 New Starts awards (Federal Transit Administration Office of Planning 2004).

The most recent rule making added affordable housing-related factors to the real estate development-related scoring criteria, which can be found in the table below, but the language remains very similar to what was initially adopted.

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30 During our interviews, policymakers involved in the drafting of the initial New Starts language described the resources they relied upon.
31 Two sections have been added, no sections have been stricken, and the only changes to the text have been the replacement of one term for transit-supportive development for another.
<table>
<thead>
<tr>
<th>Factor</th>
<th>Sub-factor</th>
<th>Items considered by evaluators</th>
<th>Statement that must be justified by applicant’s evidence to receive the highest FTA rating in the final design phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Supportive Plans and Policies</td>
<td>Growth management</td>
<td>• Concentration of development around established activity centers and regional transit</td>
<td>Adopted and enforceable growth management and land conservation policies are in place throughout the region. Existing and planned densities, along with market trends in the region and corridor are strongly compatible with transit.</td>
</tr>
<tr>
<td></td>
<td>Transit supportive corridor policies</td>
<td>• Plans and policies to increase corridor and station area development</td>
<td>Conceptual plans for the corridor and station areas have been developed. Local jurisdictions have adopted or drafted revisions to comprehensive and/or small area plans in most or all station areas. Land use patterns proposed in conceptual plans and local and institutional plan revisions are strongly supportive of a major transit investment.</td>
</tr>
<tr>
<td></td>
<td>Supportive zoning regulations near transit stations</td>
<td>• Zoning ordinances that support increased development density in transit station areas</td>
<td>Local jurisdictions have adopted zoning changes that strongly support a major transit investment in most or all transit station areas.</td>
</tr>
<tr>
<td></td>
<td>Tools to implement land use policies</td>
<td>• Outreach to government agencies and the community in support of <strong>land use transit-supportive</strong> planning</td>
<td>Transit agencies and/or regional agencies are working proactively with local jurisdictions, developers, and the public to promote transit-supportive land use planning and station area development. The transit agency has established a joint development program and identified development opportunities. Agencies have adopted effective regulatory and financial incentives to promote transit-oriented development. Public and private capital improvements are being programmed in the corridor and station areas which implement the local land use policies and which leverage the Federal investment in the proposed corridor.</td>
</tr>
<tr>
<td>Performance and Impacts of Policies</td>
<td>Performance of land use policies</td>
<td>• Demonstrated cases of development affected by transit-supportive policies</td>
<td>A significant number of development proposals are being received for transit-supportive housing and employment in station areas. Significant amounts of transit-supportive development have occurred in other, existing transit corridors and station areas in the region.</td>
</tr>
<tr>
<td></td>
<td>Potential impact of</td>
<td>• Adaptability of station area land for development</td>
<td>A significant amount of land in station areas is available for new development or redevelopment</td>
</tr>
</tbody>
</table>

32 Deletions from the original language are struck through and text added to the policies in 2013 are italicized
33 Information consolidated from multiple tables (Federal Transit Administration Office of Planning 2013).
### Factor Sub-factor Items considered by evaluators Statement that must be justified by applicant’s evidence to receive the highest FTA rating in the final design phase

<table>
<thead>
<tr>
<th>transit project on regional land use</th>
<th>Corridor economic environment</th>
<th>at transit-supportive densities. Local plans, policies, and development programs, as well as real estate market conditions, strongly support such development.</th>
</tr>
</thead>
</table>

#### Tools to Maintain or Increase Share of Affordable Housing

| • Evaluation of corridor-specific affordable housing needs and supply |
| • Plans and policies to preserve and increase affordable housing in region and/or corridor |
| • Adopted financing tools and strategies targeted to preserving and increasing affordable housing in the region and/or corridor |
| • Evidence of developer activity to preserve and increase affordable housing in the corridor |
| • Extent to which plans and policies account for long-term affordability and needs of very- and extremely-low income households in the corridor |

Plans and policies are in place in most of the jurisdictions covered by the project corridor that identify and address the current and prospective housing affordability needs along the corridor. The plans outline a strategy to preserve existing affordable housing (both legally binding affordability restricted housing and market-rate affordable housing.) The plans also explicitly address the housing affordability and quality needs of very- and extremely-low income households. Financing commitments and/or sources of funding and robust financial incentives are identified and secured to support affordable housing acquisition (including acquisition of land and/or properties intended to be converted to affordable housing), development and/or preservation consistent with adopted plans and policies. These commitments may include early phase or acquisition financing as well as permanent financing.

A strategy is in place to encourage jurisdictions to adopt local policies and zoning codes that support and encourage affordable housing development in transit corridors. Developers are actively working in the corridor to secure priority development sites and/or maintain affordability levels in existing housing units.

These qualitative evaluation measures of transit and land use coordination represent 1/12th of a project’s overall score and are aggregated with a bevy of other criteria (e.g., cost-effectiveness, local matching funds) that FTA evaluates to determine which transit applications will receive funding. To assist in the overwhelming task of reviewing applications and issuing funding award recommendations to Congress, FTA has solicited the assistance of designated contractors who gather and review land use-related information submitted by applicant agencies (Federal Transit Administration Office of Planning 2004). The contractors develop summary reports which are used by the FTA to assign final land use scores to applications. The figure below describes role and relationships for the players involved in the NSRED policy’s implementation with FTA land use contractors falling into the right-most box called “Transport Consultancies.”
The New Starts program has funded nearly every major fixed-guideway transit project built in the United States since the program’s inception in the 1970’s, and many independently-funded projects still follow federal protocols so that the local expenditures can be counted toward the region’s financial contribution to transit projects on future New Starts funded projects. In fact, during several interviews, transit professionals suggested that I review New Starts documentation to understand their transit planning practices and the major process steps they must undertake. Transit planners suggested that they must be aware of the New Starts evaluations as they plan transit to ensure that they are strong candidates for federal funding. The program funds both brand new, fixed-guideway\(^{34}\) transit facilities and extensions\(^{35}\) to existing fixed-guideway transit facilities. Such facilities can be rail transit or corridor-based bus rapid transit guideways for use by public transit vehicles (Federal Transit Administration 2013a). The hundreds of transit projects that have been funded by the program have varied in size from $25 million to several billion dollars. The program funds rail, people mover, ferry, and bus rapid transit projects. The average New Starts grant has been approximately $200 million, though project size varies greatly. For example, the Phase I construction of New York City’s Second Avenue subway received $1.3 billion in New Starts funds and the total expected project cost is $4.9 billion (Federal Transit Administration 2009). At the other end of the spectrum, the Franklin Corridor dedicated bus lane project in Eugene, Oregon, received less than 80% of its $25 million capital funding from New Starts funds (Lane Transit District 2013).

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\(^{34}\)“Fixed guideway means a public transportation facility that uses and occupies a separate right-of-way or rail line for the exclusive use of public transportation and other high occupancy vehicles, or uses a fixed catenary system and a right of way usable by other forms of transportation. This includes, but is not limited to, rapid rail, light rail, commuter rail, automated guideway transit, people movers, ferry boat service, and fixed-guideaway facilities for buses (such as bus rapid transit) and other high occupancy vehicles. A new fixed guideway means a newly-constructed fixed guideway in a corridor or alignment where no such guideway exists” (Federal Transit Administration 2013a, 2032).

\(^{35}\)“Extension to fixed guideway means a project to extend an existing fixed guideway or planned fixed guideway” (Federal Transit Administration 2013a, 2032).
Figure 7 – Transit planning process defined by New Starts funding policies\textsuperscript{36}

\textsuperscript{36} Adapted from (Federal Transit Administration 2013a)