Best Practices in Public-Private Partnership Strategies for Transit-Oriented Development

THESIS

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By

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Abstract

The purpose of this study is to explore emerging research and planning concepts in conjunction with practical case studies to yield specific insights into promoting transit-oriented development (TOD). As it relates to TOD, this thesis focuses on public sector strategies, including public-private partnerships. Each of the case study cities exhibit unique contexts, including varying degrees of market strength, existing transit ridership, and funding capacity. The TOD solutions that these case study cities implement, the focus of this thesis, are shaped by and for those unique contexts.

A review of literature will examine a broad array of sources that shed light on transit-oriented development practices in similar contexts. This discussion draws from specific examples of innovation in finance, policy, design, and planning; as well as a discussion of the advantages and disadvantages. Following the literature review, this study will analyze the historical evolution of transportation and transit policy, including federal and state-level programs. The crux of this study is ten (10) case study cities that transcend several fixed-guideway types (heavy rail, light rail, bus rapid transit, streetcar) and markets of varying size and strength. Findings on significant strategies that yield results within these case studies will be organized into benchmarks and best practices, intended as a uniquely contextual resource for emerging cities aspiring to incorporate transit-oriented development into planning for sustainable development.
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Fields of Study

Major Field ................................................. City and Regional Planning
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Introducing a “New Aesthetic of Place”

Peter Calthorpe developed the concept of transit-oriented development in the late 1980’s and in 1993 published, “The Next American Metropolis,” which was a treatise laying out the principles of transit-oriented development (TOD). As introduced by Calthorpe in this book, TOD – which leverages synergies created by encouraging people to live and work near transit services – was a practical solution for sustainable, equitable, and progressive community design. This was indeed a revolution he was proposing, going further to pit this alternative against existing practices of predominant greenfield development.

“The old suburban dream is increasingly out of sync with today’s culture. Our household makeup has changed dramatically, the workplace and work force have been transformed, average family wealth is shrinking, and serious environmental concerns have surfaced,” Calthorpe asserts (Calthorpe 1999, 15).

In this book, Calthorpe links emerging issues of equity and social stress to anachronistic development patterns that fracture communities along the lines of race, age, income, and family type. He builds up to a resounding promise that transit-oriented development can become the new American dream, which can be adapted to give communities across the nation a new aesthetic of place. In his riveting opening, he cites philosophical lineage
from Jane Jacobs (who challenged Robert Moses), Leon Krier, John Ruskin (a founder of environmentalism), Camillo Sitte (Austrian city planner, author of “City Planning According to Austrian Principles,” 1889).

This deep well of historical context, upon which Calthorpe draws, frames the perspective that shaped his concept for TOD as a holistic city-building strategy. By grounding the movement and concept so heavily in urbanist theory, Calthorpe ensured that it would remain true to this holistic nature as the concept evolves and gains popularity amongst developers and architects.

Cities Begin Mobilizing Around TOD

Transit systems and the financing of these systems has gone through several distinct periods of policy design since streetcars were first employed in the late 19th Century. At that time, these systems were initially designed, built, operated, and owned by private
corporations that made acceptable yields on fares.

In *Street Smart: Streetcars and Cities in the Twenty-First Century*, Scott Bernstein discusses three distinct transit financing revolutions that have each shifted the roles of the public and private sector. The 1970s saw a wave of renewed interest in transit, as a means of providing congestion relief in growing metropolitan areas that previously lacked urban rail systems, including new heavy rail systems in Washington, D.C. (1976), San Francisco (1972), and Atlanta (1972). It is notable that these early urban rail systems were all heavy rail, and all branded as “Rapid” transit.
A second phase of transit policy persisted through the 1980s (San Diego, 1981; Portland, 1986; Los Angeles, 1990; St. Louis, 1993; Denver, 1994; and Dallas, 1996), which saw the creation of light rail systems, most of which were in existing freight rail corridors or abandoned freight right-of-ways. In the 1970s wave, riders were expected to arrive at a station by car, preventing any discussion of transit-oriented development at stations. According to Bernstein 2008, it was the 1978 publication of *Windfalls for Wipeouts*:
Land Value Capture and Compensation (Hagman and Miscynzski, 1978) that ignited this theory, offering a compelling solution to recover the cost of public infrastructure investments.

Since 2000, the United States has seen new fixed-guideway transit systems developed along the lines of streetcar, light rail, commuter rail, and the emerging mode of bus rapid transit – this marks a third distinct phase of modern-era transit policy and design. Each of these modal options carries with it specific advantages and disadvantages that relate to the context which they serve.

The body of literature surrounding transit-oriented development in the United States has grown commensurately with the number of fixed-guideway transit systems in the United States. Increased interest and relevance of this topic led to the 2004 creation of the Center for Transit-Oriented Development (CTOD), through a partnership of Strategic Economics, the Center for Neighborhood Technology, and Reconnecting America. While this research firm will be counterbalanced with other points of view to the extent possible, they have established themselves as credible, non-biased experts on the topic, and since 2004 have completed consulting projects for transit authorities in Denver, San Francisco, Pittsburgh, Commonwealth of Pennsylvania, Seattle, Minneapolis-St. Paul, Los Angeles, and Maryland. Some of these studies are used in case studies and will be used as positive examples of physical and policy design.
As it relates to establishing credibility and impartiality for the purposes of this thesis, special emphasis will be paid to how authors compare and contrast different modal choices (specifically light rail vs. bus rapid transit), which is often contentious. CTOD, for instance, maintains neutrality over the issue, has cited a balanced slate of case studies, and has produced studies for both light rail and bus rapid transit projects.

According to the FTA Handbook, this mode choice process is otherwise known as Alternatives Analysis, which every project seeking federal funding must undergo – this process involves community input and analysis of several competing route alternatives that will frequently involve different routes and modal choices (it is now standard to analyze prospective corridors for both LRT and BRT). The determinants that drive this process relate to finding the right mode for the right environment. In a 2014 study on modal choice in Flanders, Creemers et al evaluated purportedly successful light rail systems in Charlotte (North Carolina) and Manchester (England), concluding that determinant factors are “travel cost, travel time, transit punctuality, waiting time, access and egress time, transfers, and availability of seats.” These are very practical aspects of the transit service that a corridor’s infrastructure supports. To summarize the connection to transit service and its environmental context, Creemers et al say that preferences are driven by deeper factors such as “socioeconomic variables, attitudinal factors, perceptions, and the frequency of using public transport” (Creemers et al 2014, 8). This study into transit modal choice created several traveler profiles that Creemers et al compare to the practice of market segmentation, where a demographic profile is matched
to consumer behavior. This could be considered a more anthropological explanation of Calthorpe’s previously stated mission to create a new American dream, or a new aesthetic of place.
According to Bernstein, it is the advent of modern streetcars that was the final (or most recent) revolution in transit-oriented development and financing. The 1990s and 2000s
have seen the creation of new circulator streetcars beginning in Portland, Seattle, Little Rock, Tacoma, Tampa, and Memphis – and expanding to most “Tier 2” cities since then. Whereas the 1980s wave of interest in TOD was driven by progressive transit authorities (BART, WMATA, DART) that sought to anchor their own light rail stations with supportive development, earlier TOD wave was actually responding to the grade separation challenge presented by the typical 1980s light rail alignment. These corridors, typically built in freight rail corridors and separated from street level, needed the TOD to come to them. Meanwhile, the modern streetcar is usually an electric-operated rail car that operates in a street with mixed traffic, with or without signal prioritization. Rather than light rail stations that vertically connect the street level to the light rail platform, whether on a viaduct or in a trench, a streetcar route is going to have stations right at street level, with a high degree of permeability between the transit system and surrounding real estate. This innovation has increased feasible opportunities for TOD to cover an entire corridor, and not just a half-mile radius surrounding a station. This increase in feasible TOD potential has revolutionized transit financing.

**Strengthening Investment Through Policy**
According to the EPA Office of Sustainable Communities’ guidebook on *Infrastructure Financing Options for Transit-Oriented Development* (originally published 2013, updated 2015), there are six distinct typologies of transit or TOD financing, which are often dependent on each other: Direct fees, debt tools, credit assistance, equity sources, value capture mechanisms, and grants and other philanthropic sources. Direct fees
include user and utility fees, including congestion pricing; debt tools include private debt, bond financing, and state infrastructure tools; credit assistance involves tools created by the Transit Infrastructure Finance and Innovation Act (TIFIA, 1998); equity sources often involve public-private partnerships (PPPs) and available infrastructure investment funds; value capture mechanisms often involve developer fees and exactions, special districts, tax increment financing (TIF), and joint economic development partnerships; while grants may often originate from federal and foundation sources. The EPA Office of Sustainable Communities publication lists emerging financing sources including a national infrastructure bank, redfields to greenfields, land banks, and structured funds.

Many of these tools must work together and can only cover all costs when leveraged with other sources. Successful streetcar planning processes target these sources and their requirements early, but the complexity of combining sources can also complicate planning processes. Many states have limitations on TIF and/or how it can be used for example, such as Pennsylvania where TIF requires a declaration of blight, excluding strong market transit-accessible areas such as Bryn Mawr, according to the CTOD report on Transit Revitalization Investment Districts (TRID), authored by Austin and Fogarty. The problem with this, according to the report, is that the relative affluence of Bryn Mawr does not necessarily make funds available for transit infrastructure, let alone gap financing for privately-executed TOD. The TRID report cites the 2004 Transit Revitalization Investment District (TRID) Act, which gave Pennsylvania a unique financing tool that can go beyond TIF.
Under Pennsylvania law, TRID actually has a number of advantages over TIF. The Austin and Fogarty study focuses on three distinct case studies in Pennsylvania, which resemble three unique community typologies that are all pursuing TRID, but have yet to bring a TRID financing scheme to fruition fully. In the case of Pittsburgh’s East Liberty area, historically the region’s second largest employment center after downtown Pittsburgh, TRID offered several advantages unique to that project’s context. First, Pennsylvania commonwealth law limits TIF to 10% of taxable property value within a community, and Pittsburgh is already very close to this maximum allowable TIF capacity. TIF also showed projected revenues of $16 million across the same period, compared to $18 million through a TRID. In the case of Bryn Mawr, a TRID did not
require a public declaration of blight, which is required for TIF in the Commonwealth of Pennsylvania. Lastly, the case of Marcus Hook (a small, lower-middle income community on the Delaware River south of Philadelphia), utilizing TRID brought the advantage of state support for 75% of planning costs. All of these advantages apply to every TRID, but some may mean more to different types of communities. While the study cites that no TRID has been fully executed yet, and does outline a series of recommended improvements to encourage more communities to utilize the tool, TRID is a uniquely flexible and strategic tool that is tangibly moving diverse communities toward successful development of TOD.

Figure 5 Market Maturity Curve (Siemiatycki 2010 and Deloitte)

The public-private partnerships (PPPs) that deliver transit infrastructure and transit-oriented development, also falling into distinct categories, have also been a topic of
Siemiatycki categorizes PPPs from greater public responsibility, to greater private responsibility, as follows (Siemiatycki 2010):

1. Design-Bid-Build (DBB)
2. Design-Build (DB)
3. Design-Build-Finance-Operate (DBFO)
4. Build-Own-Operate (BOO)

DBFO, which is the emergent trend among this landscape, involves expectations and performance standards set by the public, a publicly-responsible design contract, private financing, leased and operated by the private sector pursuant to a long-term contract, yet still owned in perpetuity by the public sector, returns (profits) going to the private sector, and tolls or user fees set by contractual negotiations between the public and private partners. Siemiatycki also references a “market maturity curve” for public sector transportation investments, which shows where countries around the world stand in terms of PPP sophistication and activity. At the top of the curve, with the highest sophistication and activity, is Great Britain, followed by Australia and Spain. The United States is shown as having high activity and moderate sophistication.

Siemiatycki notes one disturbing trend of DBFO public and private sector partnerships frequently devolving into lawsuits. Specifically, protracted disagreements arise over setting tolls and user fees, long-term non-competition clauses limit the public sector’s ability to respond to evolving scenarios, and transparency and community engagement is greatly reduced through these arrangements. While Siemiatycki as well as the
Government Accountability Office (GAO) have concluded the notion of PPPs tapping new funds for infrastructure is potentially misleading, and Siemiatycki even suggests such notions to be a “mirage,” the positives include enhanced project-level innovation and the transfer of financial risk to the private sector. In the “worst case scenarios,” deteriorated partnerships led to two of Siemiatycki’s three case studies eventually being sold at a discount (“under duress”) back to the public sector (Siemiatycki 2010). In an earlier Journal of the American Planning Association article, dated 2007, Siemiatycki explores the diminished transparency and public process when projects pursue PPP solutions, in part due to confidentiality agreements signed at the beginning of negotiations between public and private partners.

**Value Share Enables Transit to Drive Development Patterns**

Value capture, explored in Belzer (with colleagues Eaton, Fogarty, and Ohland), is a means of paying back up-front infrastructure bonds with back-loaded revenue generated by the TOD. In essence, this approach raises the priority of economic development as a goal of a particular transit project, due to the necessity of producing the requisite development to produce tax revenues capable of retiring the bond debt. The four distinct strategies outlined by Belzer for doing this are assessment districts, TIF, joint development, and special development impact fees. All of these methods involve developers agreeing to an exaction to support the transit infrastructure, with the understanding that the presence of high-quality transit will raise land values for everyone.
involved. The inherent challenges in doing this revolve around “difficulties in measuring the extent of the potential value and finding the best ways to capture it.” This is to say, effective assessment is key.

Heightened property values surrounding transit assets would be far from a new concept. The Belzer study on value capture gives 23 specific studies (pages 6-9), transcending land uses (retail, residential, office), transcending time periods from 1978 to 2004, and taking place across the country (San Francisco, San Diego, San Jose, Sacramento, Portland, Dallas, Chicago, St. Louis, Atlanta, and Washington, D.C.). Single family residential value premiums ranged from +2% within 200 feet of San Diego Trolley stations (1992), to +32% within 100 feet of St. Louis MetroLink Light Rail stations (2004). Condominium units within 2,640 feet of San Diego Trolley stations were worth +2% to +18% more on average (2001). Also the same year in San Diego, apartment units within 2,640 feet were worth +4% more, while in Santa Clara County, apartments within 1,320 feet of VTA Light Rail stations were assessed +45% higher values (2004).

Regarding office uses, the floor of value premium in these case studies was a +9% assessment increase for office space within 300 feet of a Washington Metrorail station (1981), whereas the ceiling was an observed +120% value premium for office space within 1,320 feet of Santa Clara County’s VTA Light Rail (2004). In the retail realm, retail space within 500 feet of a BART station saw a minimal +1% value premium, whereas retail space within 200 feet of a San Diego Trolley station saw a +167% value
premium, the highest across the board for any typology, interestingly for the system that generated the lowest value premium for residential land uses.

The Belzer study also reports a land speculation phenomenon that bears a stymying effect on TOD, in some cases. Not unlike other large public works projects, once announced, the “increasingly high-profile nature” puts a spotlight on sites, leading asking prices for land to skyrocket. Belzer cites the example of Midtown Houston, where new development has transpired on less expensive sites further away from the light rail corridor. Belzer suggests that the real estate market “may eventually catch up with property owner expectations” regarding the value of their transit-adjacent property, “but so far speculation has choked off the potential for TOD in Houston” (Belzer 2008). In the same section on land speculation, Belzer cites Charlotte’s South Corridor as an example where the increased spotlight resulted in TOD implementation before or despite the issue of speculation. Belzer also cites that this concern is prevalent in the Twin Cities and Denver.
Overcoming the speculation issue, transit does offer two possible solutions that can enable high-density development, which is where a taxing authority would observe the highest value premiums related to transit-accessible sites. These solutions both relate to parking, which can cost a developer $20,000 to $50,000 per space according to Belzer – but can be minimized with transit access and lower required parking ratios. At the same time, the transit access allows a developer to charge higher rents, recovering higher development costs. Belzer shows a chart where different development typologies, such as townhome, podium-parked apartments, and the “Dallas Donut” configuration (apartments wrapped around an internal parking garage) also yield much higher expected profit per square foot of land, versus sites before transit. While development with 6+ stories (generally steel frame construction) may still be infeasible in the typical scenario, it is brought closer to break-even by the addition of transit to a site.

Figure 7 Graph showing development value added by transit. (Belzer, 2008)
The Streetcar Revolution
Reconnecting America specifically touts streetcars toward the singular goal of TOD in its report on “Why TOD and Why Now.” Streetcars, it argues, “are the hot new transit technology.” Streetcars offer many strengths, but as it relates to TOD, perform very well as economic development generators because they are designed specifically for small, compact, walkable areas. A streetcar corridor is a very intimate experience, in other words. Opponents of streetcar projects, such as Vox’s Matthew Yglesias, conversely argue that these strengths are actually limitations: lower speeds, mixed traffic, moderate costs, often shorter routes, and “evil” (Yglesias 2014). While it is difficult to address Yglesias’ overarching charge of evil – which must be considered along with other criticisms of streetcars – many of these “limitations” relate to any transit vehicle that operates amidst cars, bikes, pedestrians, and streetscape elements – where people are (Reconnecting America 2015). The same Reconnecting America report specifically argues that the visible (and unmovable) track components of rail-based transit corridors are a primary driver of TOD, giving developers long-term assurances of high-quality transit service. Meanwhile, bus lines have and will continue to be moved, preventing their consideration into business decisions regarding real estate.

Furthermore, many of the “limitations” are more frequently viewed as strengths. The lower speeds at which streetcars often operate are much safer and allow for a higher degree of direct pedestrian connectivity. Meanwhile, rapid transit systems which often
run on heavy rail within grade-separated ROWs, only interact directly with pedestrians at designated station platforms, which even still comes with inherent safety risks. The safer operation of streetcar amidst mixed-traffic and intimate streetscape environments provides pedestrians safety assurances that allow pedestrian activity to thrive alongside streetcars.

![Table of streetcar system cost compared to TOD investments. (Reconnecting America, 2007)](image)

Figure 8 Table of streetcar system cost compared to TOD investments. (Reconnecting America, 2007)
According to Reconnecting America’s report, SAFETEA-LU’s “Small Starts” program, which will be described in the policy chapter (Chapter 2), was specifically intended for “starter” streetcar systems where a community might build the first few miles and gradually expand from there, similar to how Portland (which has seen $2.3 billion in TOD according to this report) first started with 4.8 miles of track in 2001 for a cost of $11.5 million per mile, and then completed a 1.2-mile expansion in 2005 at a cost of $14.83 million per mile. Streetcar projects are highly flexible, and can very cost-effective, depending on the context and engineering challenges presented by any particular alignment. In Kenosha, Wisconsin – a streetcar system was built in 2000 for $3 million per mile. Little Rock, Arkansas implemented one for $7.84 million per mile, including a lengthy bridge across the Arkansas River. $20 million per mile is often a typical number for a high-end modern streetcar.

Development patterns also are likelier to follow transportation systems, rather than jurisdictional boundaries. Toward this extent, regional-scale planning is necessary to make rail transit, and particularly TOD, feasible. The Anderson and Zimbabwe study on Planning for TOD at the Regional Scale cites 8 important steps for regional TOD planning (Anderson 2011, 12):

1. **Plan for the Plan**

2. **Get to Know Your Region**

3. **Invest in Capacity Building, Education, and Technical Assistance**
4. Develop a Regional Vision for TOD

5. Identify a Strategy for Prioritizing and Phasing Investments

6. Create Incentives for Local Action

7. Provide Funding for Implementation

8. Measure and Evaluate Progress

Denver is given as a strong case study for pre-planning for TOD, and also stands one of the nation’s most successful cities when it comes to TOD. The Denver Regional Council of Governments invested in capacity building very early on when the MPO created a “TOD Information Exchange Program,” which serves an advisory role to help policymakers, business leaders, and the public at large make effective decisions about TOD. This program also hosts networking events called the “Metro Vision Idea Exchange.” On the heels of this collaborative exchange of ideas, 48 of 52 local governments in the Denver area signed onto the “Mile High Compact,” all agreeing to adhere to growth principles from the region’s long-range growth plan.
In Dallas, the North Central Texas Council of Governments provides grants for planning and infrastructure that support the role of TOD in the region’s vision for growth. In 2009 alone, NCTCOG’s Sustainable Development Call for Projects allocated $43 million to foster development around historic Main Streets, infill areas, and light rail stations. Capital grant awards averaged $2.5 million for each project, with funds going toward sidewalks, trails, and other infrastructure (Anderson, Zimbabwe 2004). Anderson and Zimbabwe 2004 also cite the example of the 200-unit Atmos Lofts in downtown Dallas, which was financed in part by NCTCOG’s Sustainable Development Call for Projects.
**Gentrification Station**

Through regional collaboration, planners can also plan for mixed-income TOD, which includes proactively planning to avoid common pitfalls. These pitfalls are complicated by the recent Supreme Court housing ruling and subsequent HUD policy on “Affirmatively Furthering Fair Housing,” cautioning against investing in high-poverty qualified census tracts that concentrate poverty, which were previously encouraged and incentivized. The 2010 Dukakis Center for Urban and Regional Policy at Northeastern University report on *Maintaining Diversity in America’s Transit-Rich Neighborhoods* (Pollack, Bluestone, Billingham 2010) offered a critique of the implications for transit on housing affordability, which on one hand speaks to its effectiveness as an economic development tool, but on the other hand validates concerns raised by Kate Lowe 2010 regarding the public process and transparency behind rail planning (Lowe 2010 studied Boston and Miami, focusing on interviews with residents and advocates).

The Dukakis study shows a demographic profile of the average transit passenger being racially and economically diverse. Indeed, 15.8% of riders for instance report a household income between $50,000 and $74,999; while the largest grouping, 30.8% of riders report a household income between $25,000 and $49,999. Pollack, Bluestone, and Billingham 2010, notes that previously transit investments were considered to be a disamenity “and even a poverty magnet,” the recent turnaround in public perceptions around transit has shifted the concern toward gentrification in communities that benefit from transit investments. Their study discusses the trajectory of Somerville, MA’s Davis
Square neighborhood, where MBTA extended the Red Line and added a transit station in 1984. In 1970, prior to this investment, only 8.2% of adult residents were college graduates; in 2000, 16 years after the MBTA investment, 49.7% of Davis Square’s adult residents reported a college degree. This proportion is even higher than the Boston metro’s average of 39.6%, which is already among the highest in the nation. The study then isolated transit-rich neighborhoods across the nation, and concluded that rates of automobile ownership increased faster in 71% of these neighborhoods, compared with 57% of non-transit “rich” areas. Worse yet, rates of multiple automobile ownership (two or more autos) increased in 57% of transit-rich neighborhoods. This study claims “we can confidently say that our analysis found evidence of gentrification in the majority of newly transit-served neighborhoods” (Billingham 2010) to which they attribute the rise in automobile ownership, as a proxy of increased wealth.
The Lowe 2010 study, Bypassing Equity, in comparison focused on the extent to which regional rail planning initiatives were transparent and involved the public, particularly in environmental justice (EJ) geographical areas. Lowe 2010 claims, based on interviews with advocates and planners both inside and outside the government, that MBTA’s rail investment timeline was dictated by agreements with the Conservation Law Foundation, which threatened to delay Boston’s Big Dig project with lawsuits if they had not pledged to mitigate the freeway project with new light rail lines. It was this strict agreement with a stakeholder (CLF) who was not professionally-bound in their duties to EJ communities in Boston, that set the agenda for MBTA rail expansion. This marked a diversion from the typical transit planning process with protocols in place for interacting with EJ communities. That said, Lowe writes about how advocates in the Boston area were

Figure 10 Affordable housing development on the Twin Cities Central Corridor at the Hamline-Midway Station. N. Emenhiser, January 2016.
successful in ensuring the completion of new stations on the Fairmount Line, serving the heavily-African American south side of Boston.

To combat the negative effects of gentrification, regional partners must plan for TOD that incorporates affordable housing. In another CTOD publication, *Transit Corridors and TOD* (Thorne-Lyman and Wampler 2010), the publication highlights the importance of including developers and especially affordable housing developers in a larger stakeholder group to guide regional TOD implementation. In the Twin Cities, community members and advocates for affordable housing have been particularly influential in TOD planning along the Central Corridor, linking the downtowns of Minneapolis and St. Paul, through an array of ethnic inner city communities. This group of advocates, with backing from the Central Corridor Funder’s Collaborative, was successful in lobbying the Federal Transit Administration to add three new stations, increasing equitable access to the light rail system. Particular focus, as evidenced by conditions on the ground, has been placed on production of affordable housing units along the corridor. Thorne-Lyman and Wampler 2010 also list the BRT HealthLine corridor in Cleveland as a successful example of attracting mixed-income housing – by 2010, Greater Cleveland RTA claims $4.3 billion in TOD along the line.

There is an emerging trend amongst the research and literature provided, let alone among policy think tanks that are driving this urban agenda, that transit-oriented development should be inclusionary, at a minimum. Toward this goal, Minneapolis is far from being
the only city that is specifically targeting affordable development in areas that become ripe for TOD. Reconnecting America (Desmuke 2013) has also studied the Metro Green Line corridor in Los Angeles toward this goal. The Green Line in LA is also sometimes known as the Crenshaw Line, which was built in 1995 as underground light rail (very similar to subway, except lacking heavy rail vehicles).

The Reconnecting America (Desmuke 2013) study analyzed four isolated stations on this line (Hawthorne, Crenshaw, Vermont, and Avalon). This study induced the following as legitimate means of promoting affordability within TOD areas: 1, rent stabilization ordinance; 2, looking holistically at the Housing + Transportation (H+T) Index rather than just exclusively on housing costs; 3, inclusionary zoning; 4, home-owner subsidy programs such as the “Location Efficient Mortgage” program developed in 1995 by the Institute for Location Efficiency; 5, prioritizing transit-accessible sites for new subsidized housing developments. While rent stabilization ordinances and inclusionary zoning are often drawn-out policy battles, any city regardless of policy or capacity can prioritize transit-accessible affordable housing sites and encourage financial underwriters to consider the H+T Index holistically. Interestingly, it turns out that Scott Bernstein, the author of “Street Smart: Streetcars and Cities in the 21st Century,” oversaw development of the “Location Efficient Mortgage” program, and has also been involved in a leadership role with the Center for Transit-Oriented Development.
While most of these have been previewed already, it is also valuable to look at the Center for Transit-Oriented Development resources collectively as a singular body of work. There are 9 resources altogether, including “TOD 101: Why TOD and Why Now?,” “TOD 201: Mixed Income Housing Near Transit: Increasing Affordability With Location Efficiency,” “TOD 202a: Station Area Planning,” “TOD 202b: Transit & Employment,” “TOD 203: Transit Corridors & TOD,” “TOD 204: Planning for TOD at the Regional Scale,” “TOD 205: Families and Transit-Oriented Development,” “Realizing the Potential: Expanding Housing Opportunities Near Transit,” and “2010 Inventory of State, Regional, and Local TOD Programs.”

An overall finding is that different regions and planning entities are engaged in TOD planning and implementation for different reasons. The motivations cover a wide range of the following:

1: Congestion relief
2: Environmental improvements and sustainability
3: Walkability and public health
4: Increased transit ridership and fare revenue
5: Economic development and added community value around transit areas
6: Broaden mobility choices to provide residents lifestyle improvements
7: Intrinsic motivations, perhaps including image branding and tourism.
Together, these motivations may seem diffuse, and indeed some can be more directly influenced through transit and TOD investments than others, but all of these issues are linked. On the whole, the real value of transit and TOD is in linking resources across the board. For instance, if a community has affordable housing but lacks a concentration of low-income accessible jobs, perhaps that connection can be made across space through transit. Just as that illustration can visually represent such a project, more importantly that project’s stated goals can transcend those motivations. In that way, a project can evolve from paper into reality and still resemble its stated goals from its planning process.

Figure 11 Reconnecting America website inventory of TOD programs
The variety of TOD programs break down by geographies, including state-level, region-level, and local-level; as well as by program type, including planning, property acquisition, and implementation. This map and listing has been compiled by Reconnecting America. The only TOD program listed in Ohio, for which they may have stretched the definition a little, is Transportation for Livable Communities Initiative (TLCI) administered by the Northeast Ohio Areawide Coordinating Agency (NOACA). NOACA is the MPO for Cuyahoga, Geauga, Lake, Lorain, and Medina counties (metropolitan Cleveland, minus Akron). This program allocates approximately $1 million each fiscal year, with individual planning grants of up to $75,000. There are 10 goals that projects must advance. In total there are 42 programs nation-wide, including 18 at the state level, 15 at the regional and transit agency level, and 9 at the local level. 28 provide funding for implementation, 19 provide funding for planning, and 11 fund property acquisition.

One significant item missing in the literature is linking the importance of mixed-income development with the concept of value capture, and the implications that mixed-income strategies may have when combined with value capture strategies for financing the infrastructure.
Key Literature Findings
Several major key findings arise out of the literature reviewed to this point. At the 30,000 foot level, the findings either set-up a structural understanding of transit and TOD policy, or lend critical insights that highlight pitfalls to avoid, emerging best practices, and important thematic connections.

Structurally, these literature findings can be summarized as A, distinct periods of transit policy and public finance (1, historic streetcar companies; 2, 60s-70s era heavy rail; 3, 80s-90s era light rail; and 4, 2000s modern streetcars); B, transit mode options that increase in cost as they expand their physical presence; C, geography and policy types for TOD programs; D, types of development patterns along transit corridors; and E, distinct types of transit corridors, usually going back to the distinct period of public finance in which a system was developed.

Thematic connections that become critical through the conclusion of this revolve around community development. The cities that succeed in TOD, for example Denver, are buoyed by the rising tide of greater community development participation. Many of the communities that still struggle with TOD are the same as those that have raised red flags for citizen input and planning equity (Boston, Miami). Toward this end, not only is community development critical, but so is community organizing. The other vital policy
areas to bridge include economic development and regional planning. Just as economic development is often planned at the regional level, there could be synergies for integrating regional TOD planning into the same process.

The body of literature is heavily weighted toward rail systems, largely due to the sheer volume of rail transit compared to bus rapid transit at this point. Most findings on rail are positive with regards to transit level-of-service and economic development, the oft-stated goals – except in instances where the scale is tipped toward gentrification, which is explored in four sources. Bus rapid transit, an even-yet newer concept, has seen positive reviews as well – particularly when studies adjust impacts for the dollar amount spend on infrastructure, which is called “transit leverage.”

Nearly every analysis of a specific policy instrument or goal is accompanied with claims of “1-to-multiple” return on investment ratios; Portland, for instance saw over 10 times as much in TOD as was spent on streetcar. Overwhelmingly positive bottom-line results (even amidst mixed results on specific policy goals) bodes well for transit as an economic development driver in other cities. Not unlike value capture’s leveraging of financial flows to pay off infrastructure bonds, the results also show that TOD can proactively create and support strong ridership. Both resemble ways of jumping ahead to reach the inputs needed to get a transit project off the ground. In this way, through careful and deliberate planning that makes physical and policy connections, transit projects create and cement a virtuous cycle that allows cities to jump ahead themselves.
Chapter 2: A Historical Review of Policy Implications for States and Transit Agencies

The evolution of historic transportation and transit policy is important to analyze first, in order to fully understand how American cities arrived to their current transit situations. This is especially key toward the goal of isolating innovations, which will be explored in the case studies (Chapter 3), and then identifying the contexts to which these innovative TOD strategies could effectively further sustainable development goals.

Federal Transportation Legislation
As cities endeavor to create transit systems and transit-supportive neighborhoods, the extent to which the two components are intertwined is grounded in practice as well as policy. As cities exist as “creatures of the state,” and as states have “all powers not delegated to the United States by the Constitution,” this exploration of federal policy history is intended to yield insights on why transit-oriented development (TOD) was non-existent up until recently. Transit is one area of planning that is particularly dependent on federal policy for funding.

Transportation policy, not unlike other government operations within the planning realm, is guided by a system of legal checks and balances in which the policy aspects are evenly distributed between executive, legislative, and judicial bodies. While the executive branch, in which state Departments of Transportation (DOTs) are housed, plans and
implements individual projects – policy is typically set by legislative bodies that draft spending bills. The judicial branch is typically involved in arbitrating disagreements and overseeing planning and implementation’s compliance with long-standing policy acts.

The most pertinent acts that have guided transit policy include the Federal Aid Highway Act of 1944, the Interstate and Defense Highways Act of 1956, the Federal Act Highway Act of 1956, the Urban Mass Transportation Acts of 1964 and 1970, the Surface Transportation Assistance Act of 1982, the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, the Americans with Disabilities Act of 1991, and the Safe, Accountable, Flexible, Efficient Transportation and Equity Act: A Legacy for Users (SAFETEA: LU) of 2005. More recently, the Obama administration’s transportation policy has been shaped by the American Recovery and Reinvestment Act of 2009, commonly known as the Stimulus, the most significant component of which was a one-time injection of funding to the Transportation Investment Generating Economic Recovery (TIGER) supplementary discretionary grant program. This is the first instance of federal transportation policy that is foremost grounded in economic development. A chronology of relevant federal transportation acts is listed below, while each will be described in further detail through this chapter:

1. Federal Aid Highway Act of 1944
2. Interstate and Defense Highways Act of 1956
4. Surface Transportation Assistance Act of 1982
5. Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991
6. Safe, Accountable, Flexible, Efficient Transportation and Equity Act: A Legacy for Users (SAFETEA: LU) of 2005
9. Fixing America’s Surface Transportation Act (FAST Act) of 2015

The typologies of urban rail transit systems often follow a distinct pattern relating to the various periods of transportation policy (and its subsequent funding). In Street Smart: Streetcars and Cities in the Twenty-First Century, Scott Bernstein 2007 identifies three distinct funding periods within urban transit (following public “takeover” of transit systems): 1, the heavy rail systems of the 1970s; 2, the early light rail systems of the 1980s; and 3, the light rail and streetcar systems of the 2000s. Each of these modes were in some ways a response to the predominant flavor of policy from that period.

After the disintegration of privately-held streetcar companies in the 1940s and 1950s, it was the Urban Mass Transportation Act of 1964 that began a shift in policy that put mass transportation under the purview of the Department of Housing and Urban Development (HUD), which was finally cemented by the Urban Mass Transportation Act of 1970 that gave HUD allocation authority over $10 billion in grants over 12 years. It was this program that began a legacy of matching grants at best, and mere gap funding at worst, for local transportation initiatives – offering only up to 50% of capital expenses, and
requiring a long-term local plan for funding of maintenance and operations. These two acts demonstrated a unique period in which transportation policy became bifurcated into two distinct silos, with DOTs funding highways, and HUD funding transit. Lacking literature on underlying motives behind this legislation, it appears that transit and transportation were viewed as separate, completely unrelated issues.

The Surface Transportation Assistance Act (STAA) of 1982 was the next major revolution within federal transportation policy. Marking a departure from the constrained transportation policy of the 60s and 70s, STAA sought to reunify transportation policy that had previously been split into three distinct silos: transit, highways, and safety. This act, brought to fruition by President Reagan’s support, is also notable for doubling the gas tax from 4 cents to 9 cents, with 1 cent dedicated to supporting transit for the first time (the rest of the increase funded highway construction). Subsequent transportation policy acts have often followed this model of leveraging the gas tax, redistributing a portion of revenue to fund transit programs.

ISTEA, in 1991, was passed in the same year as the ADA as well as the completion of the original extent of the Interstate System. It was the convergence of those milestones that influenced ISTEA, which moved further to comprehensively integrate transportation policy. ISTEA moved federal transportation policy away from the narrow goal of only building highways, and toward greater flexibility in project planning and implementation (Barnhart 2011). It also expanded the number of programs that were eligible for federal
support. This expansion in scope, offering up entirely new transportation modes, also increased the competitiveness of FTA grants. ISTEA impacted the lives of Americans through mandating air bags, as well, which became possible by broadly integrating transportation funding with safety policy as well.

SAFETEA-LU, passed in 2005, was not unlike its predecessor highway acts in funding primarily highways. That said, SAFETEA-LU marked the inception of FTA’s New Starts program, which can be credited with beginning the recent wave of modern streetcars – across more than 30 cities. New Starts was also supplemented with Small Starts, which was a similar program for projects that were capped at $75 million in Small Starts resources. SAFETEA-LU originally authorized $6.6 billion in New Starts funding through the fiscal year of 2009, and was extended to the tune of $2 billion for the fiscal year of 2010. With 2010’s reauthorization of $2 billion for New Starts, $200 million (10%) was set aside for the Small Starts program. As New Starts was just one example of what SAFETEA-LU offered in terms of transit funding, the total SAFETEA-LU modal funding split was $228 billion for highway programs, and $53 billion for transit programs. SAFETEA-LU authorized “more than 108 individual programs,” including nine that are considered the “core programs” that break down as six for highways, and three for transit (Lang, Shoup 2011).

Since SAFETEA-LU expired in 2011, federal transportation policy has been characterized by a series of short-term highway bills – the full extent of what was
politically feasible to enact during this period marked by Congressional “gridlock.” This period of successive short-term, six-month extensions hampered long-term capacity for policy planning, let alone planning and implementation of individual projects. In late 2015, Senator James Inhofe (R-OK) was able to find political support for a new groundbreaking transportation act, marking an end to the extensions. This coalescing of support for a long-term transportation bill was in part due to Inhofe’s stature amongst Senate Republicans (Jaffe 2015), as the Senate had just been reclaimed by that party, and his long-term role in infrastructure policy (Inhofe was Mayor of Tulsa from 1978-1984). The Fixing America’s Surface Transportation (FAST) Act, authorizes $305 billion to be spent over 5 years.

As the FAST Act is the first long-term federal transportation bill passed following a series of short-term extensions of MAP-21, the act is a major update to national transportation policy. While highways remain the focus of both policy and spending priorities, there have been substantial increases in funding for mass transit. This increase includes a 17% increase across the board for public transit projects over the bill’s five-year span. Next City, a non-profit journal, declares the biggest winners to be bus operators (Smith 2015). The Bus and Bus Facilities program will see a 62.5% funding increase, as well as the resuscitation of the Bus Discretionary Grant program, which will provide $53 million for low-emission and emission-free bus purchases (Smith 2015).
Just a mere 45 years after UMTA in 1970 brought transit within the realm of transportation policy, the FAST Act does the same for TOD. The FAST Act revises the TIFIA (Transportation Infrastructure Financing and Innovation Act) loans program to extent the scope of TIFIA to include TOD projects that enhance station areas. The revisions also lower the minimum threshold to apply for a TIFIA loan to $10 million, enabling smaller projects to receive funding. TIFIA was passed in 1998 and authorized for budget authority of $1.75 billion, primarily intended to fund toll-backed projects at the state and local level that had experienced financing difficulties due to the unreliability of tolls as a revenue stream. With the FAST Act revision, TIFIA will now treat privately-developed TOD the same as a toll-backed highway project. Despite the expansion of program scope, the program is one of the few that receive cuts under the FAST Act, going from $1 billion in FY 2015, to $275 million for 2016 and 2017, $285 million in 2018, and $300 million for 2019 and 2020. Similarly, the federal match under the New Starts program has been changed from 80% to 60%, now requiring for a 40% local match.

The FAST Act will also have major implications for the advancement of “complete streets,” allowing the use of “alternative road and street design manuals” with federally-assisted street projects (Smith 2015). “Complete streets” is a design concept for creating streetscapes that balance access and space for pedestrians, bicyclists, motorists, and transit riders – many cities will often pass a complete streets ordinance to guide their future streetscape efforts. In the past, federal funding often meant that outmoded design
standards would prevail, requiring truck-accessible turning radii, lane widths, minimum speed limits imposed, and so on. This acceptance of “Complete Streets” design manuals will have productive implications for TOD projects, combined with the FAST Act’s extension of the TIFIA program’s scope to encompass TOD projects. Some local governments will also benefit from 55% funding increase in suballocated funds that go to metropolitan areas with less than 200,000 inhabitants.

For the first time, Amtrak is included in a federal transportation bill – which must still be counted as a checkered victory for intercity passenger rail because while the bill allocates $8 billion over the next five years for Amtrak, this is far less than what the bill is authorized for (it is actually common for federal programs to be allocated a fraction of their funding authorization). Amtrak, officially the National Railroad Passenger Corporation, is a quasi-public for-profit corporation that receives federal appropriations. The legislation also directs Amtrak to create two distinct accounts for the National Network (NN) and the Northeast Corridor (NEC), which for the first time will split Amtrak’s finances between the profitable Northeast Corridor and the rest of the network. Of the $8 billion overall, $2.6 billion is directed toward the Northeast Corridor, and $5.5 billion is directed toward the National Network. The Atlantic magazine has hailed this as a victory for the Northeast Corridor, allowing the NEC to reinvest its profits into the NEC instead of “subsidizing money-losing (but Congressionally mandated) routes in other parts of the country” (Jaffe 2015). Rail advocates and researchers in “other parts of the country” have not yet significantly analyzed the impact of this revised funding model,
though the National Association of Railroad Passengers opposes “pitting the Northeast Corridor against the National Network,” arguing against concentrating passenger rail investment to profitable routes. The FAST Act also provides $199 million for positive train control (PTC), a safety mechanism that famously failed in the 2015 Philadelphia Amtrak crash. However, full implementation of PTC across the entire Amtrak network could cost between $6.7 billion and $22.5 billion (Kapps 2015).

An Overview of Local, Regional, and State Programs

Federal policy impacts split along the lines of infrastructure and TOD itself. Development around transit assets requires that a transit asset first be built, so that must preclude any investment in TOD. As it relates to transit infrastructure, federal policy has gone from 0 to 60 since STAA in 1982 first integrated all forms of surface transportation under the same appropriations bill. However, federal policy for TOD is still in a fledgling state, with TIFIA loans only just now made available for TOD implementation, but not without being significantly slashed along with the expansion in scope. Given the relatively limited federal role in TOD implementation, beyond what individual TOD sites may qualify for (Empowerment Zone funding, Low Income Housing Tax Credits, New Market Tax Credits, EPA brownfield grants, etc) on their own merits, this has made TOD funding the exclusive domain of states, regional governments including transit agencies, as well as local governments.
Given these considerations, the state and local level have been the primary source of recent TOD policy. Reconnecting America’s inventory of TOD programs includes 42 programs altogether at the state (18), regional (15), and local level (9). It is these programs that comprise the majority of public support for TOD, including 19 of these programs that assist TOD planning, 11 that assist with property acquisition, and 28 that provide funding for implementation. While federal programs support transit infrastructure and service, and have increasingly come to offer limited bond financing for specific projects, these more localized programs are almost entirely project-specific.
Table 1 Summary of State TOD Programs

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<tr>
<th>State</th>
<th>Planning</th>
<th>Land Acquisition</th>
<th>Implementation</th>
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<tr>
<td>California</td>
<td>Community-Based Transportation Planning Grants: $3 million annually in grants for plans that integrate TOD into community goals</td>
<td></td>
<td>TOD Housing Program: $1.35 billion in low-interest gap financing, 15% affordable set-aside</td>
</tr>
<tr>
<td>Oregon</td>
<td></td>
<td></td>
<td>Vertical Housing Program: 80% tax abatement over 10 years, increases offered for affordability inclusion</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Land Acquisition for Affordable New Development (LAAND): Loan financing for affordable housing near transit</td>
<td></td>
<td>Transit Improvement Areas (TIA): Loan program for TOD that increases ridership</td>
</tr>
<tr>
<td>Illinois</td>
<td></td>
<td></td>
<td>Economic Development for a Growing Economy (EDGE): Program includes Business Location Efficiency Incentive of 10% tax credit for businesses selecting site within 1 mile of transit and affordable housing</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>Transit Revitalization Investment Districts (TRID): Planning grants and process to designate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>Description</td>
<td>Funding</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Maryland</td>
<td>value capture a la TIF, barred from being used for a single real estate project</td>
<td>2008 TOD Law: $3 million in capital funding, official designation also provides eligibility for more state financing; Maryland Sustainable Communities Act: $10 million in grants for historic structures and expanded eligibility for non-historic structures in TOD sites</td>
<td></td>
</tr>
<tr>
<td>New Jersey</td>
<td><strong>Transit Villages</strong>: $1 million planning grants, other assistance; <strong>Transit Friendly Planning Program (TFPP)</strong>: Match funding for planning around passenger transportation facilities</td>
<td>Urban Transit Hub Tax Credit: Must employ 250 on-site</td>
<td></td>
</tr>
<tr>
<td>Connecticut</td>
<td></td>
<td>TOD Bond Program: Planning funding, facilitation grants of $250,000-$1 million, permitted to award $10 million over two years (pilot program); Housing Incentive Zone</td>
<td></td>
</tr>
<tr>
<td>Program: Technical assistance and cash incentives to municipalities, 20% affordable set-aside ($2,000 per multi-family unit, or $5,000 per single-family unit)</td>
<td>Massachusetts</td>
<td>Commercial Area Transit Node Housing Program: $10 million in zero-interest loans, capped at $750,000 or $50,000 per unit; MassWorks: $30 million in grants, 25% affordable set-aside; Housing and Smart Growth Incentives: Payment to municipalities that give density bonuses to TOD sites, 20% affordable set-aside; Smart Growth School Cost Reimbursement: Reimburses schools for enrollment increases resulting from TOD</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>
Local, Regional, and State-Level Foster Policy Innovation

While the bulk of TOD programs exist at the state-level, the regional scale has also been effective at creating TOD planning and implementation programs. Indeed, transportation is a phenomena that happens at a minimum at the regional scale; commuters and trips almost never follow municipal boundaries specifically, making it impractical to implement TOD funding at solely the municipal level. It is also worth noting that funding can often be made available at the state and regional level, whereas the municipal level is less practical.

There is a distinction between the three typologies of TOD programs: planning, land assembly, and implementation. All of these are absolutely vital to the goal of producing a vision for a high-quality TOD and then developing it. However, it may be more effective for a planning program to be housed within state government, where there may be more synergies with transportation planning that is already moving forward.

Land assembly is perhaps the most flexible type of programs, and also perhaps one of the rarer areas of public involvement, but it can be very effectively done at the regional scale where an RTA may already own land on or adjacent to transit corridors – at a minimum, air rights partnerships can be included here. Implementation programs, usually cash grants or tax incentives provided to TOD projects, can also be done at any of these scales. The state may be best positioned to find funding to allocate, whereas it may be the transit
agencies that actually benefits the most, therefor motivating these agencies and often their regional governing structures to find funding for TOD.

TOD implementation programs at the municipal scale are perhaps the most interesting emerging laboratories for program innovation, where cash-strapped cities still want to move the needle on TOD as a means of competiveness amongst their peer cities, and even within their region. All of these actors at different levels of government are pursuing TOD for often their own objectives and goals. With successful coordination and planning of both policy and geographic goals, these programs can all operate in sync and affect the desired transit-oriented development.
Chapter 3: Methods and Background on Case Studies

The Case for These Case Studies
The value of case studies is the ability to visualize a singular innovation or best practice. Local settings excel in their role as laboratories for urban planning and development – often fueled by competition amongst cities to either innovate or most-fully implement transit in particular. In singling out cities that are all implementing meaningful transit projects, there are no categorically negative cases among these case studies, just by virtue that these cities are taking action. Among the case studies, three groups of cities were evaluated: 1, Established Leaders, Established Innovators, and Emerging Innovators.

The Established Leaders set of cities are those where transit has become the dominant form of commuting, and getting around on an everyday basis. These three cities – Washington, D.C., Philadelphia, and Dallas – offer insights into how a city can evolve with an emerging transit-rich context. These cities have not stopped making targeted investments in TOD, nor have they stopped investing in their transit infrastructure. These cities resemble the importance of continued, sustained growth and investment toward achieving their goals for sustainable development. While Dallas is relatively new to transit, first implementing the DART in 1996, the scale to which the system has
rapidly expanded – making it the largest light rail network in the nation – constitutes placing Dallas in a league with Washington and Philadelphia.

Another set of cities are forced to innovate in order to spread the reach and impact of their transit resources, by prioritizing the areas served by fixed-guideway transit. These cities are marked, not only by a contentious tug-of-war over how to best deploy scarce public resources for transportation, but these pressures also positively shape the role of a city’s transitscape. These cities are finding ways to maximize their TOD impact, leverage financial resources, test out innovative concepts, and chronologically prioritize investments to grow the pot of available resources over time. Some of these cities – Established Innovators such as Minneapolis, Cleveland, and Pittsburgh – are finding ways to expand on their existing transit assets and create a more comprehensive transitscape.

Other cities – Emerging Innovators such as Cincinnati, Detroit, Kansas City, and Oklahoma City – are creating effective transit networks from scratch, and simultaneously must find ways to create transit-supportive neighborhoods. These cities are in a particularly valuable and formative stage of transit development, where decisions are being made now that will impact the evolution of their transit system and resulting urban fabric. The findings from the first two groups of cities will be prescriptive for this group of cities that is notably starting out from scratch.
This “ranking” of tiers, in which case study cities fall, serves as immediate context with which to organize findings. These tiers represent meaningful differences and similarities between each of the case studies, and allow for each tier to more meaningfully compare and contrast against more comparable cities. These tiers are also fluid, as indicated by Minneapolis and Dallas, which are both quickly ascending the ranks of transit-propensity communities.
Case Study Methods
This study employs a three-pronged approach to evaluating case study cities: 1, scale and other quantifiable attributes; 2, transit infrastructure; 3, TOD and specifically the nexus between the TOD and the transit. The first two aspects are straight-forward, whereas the third and final evaluation metric requires both policy and visual analysis.

Policy analysis is key toward ascertaining the financing of both the transit and TOD, as in many cases the financing was in some way linked through the leveraging of one or the other. Policy analysis will accompany each case study through a discussion of TOD policy (specifically) and strategy (broadly). Visual analysis is key toward understanding the spatial connections between the transit and its resultant TOD, and specifically how connected the two actually are. This visual analysis is conducted primarily by picking out significant TOD projects in each metropolitan area; and while significance is subjective, that significance will be described in each case. In many cases the TOD projects are the first and/or largest TODs in each case city, whereas those that do not fall into this category represent the clearest policy influences.

This is supplemented by a photo appendix, with all photos taken by the author of this thesis in the course of exploring all of these physical environments in person. Insights gained on the ground in each of these case cities will also be woven through each case study.
The goal of these case studies is to produce comparative insights, isolating key factors, and evaluating both new ideas from each city, as well as the success of basic concepts. The basic question is how to maximize TOD, which also speaks to the synchronization between a city’s transit network and its real estate market. Markets, precisely like traffic and commuting patterns, transcend city limits – and stress the importance of both “wrap-arounds” (following transit development with development programs) and regional-scale planning (including multimodal connectivity). How important is it to follow transit implementation with multimodal connectivity and/or wraparound programs? In addition to evaluating the physical aspects of each transit system, these case studies will seek to isolate those factors in order to evaluate the market response in the form of TOD.

These case studies were chosen because they are not New York City or Los Angeles, but at the same time offer glimpses into scaling-up similar transit networks found in the Transit Innovator grouping. In addition to similarities in transit modes and alignments, these three Established Leader cities offer specific insights on the market response in each of these scaled-up contexts, with or without regional planning and wraparound programs. While all transit agencies with rail understand the importance of promoting and planning for TOD, it has been more of a focus of WMATA and DART. By virtue of comparison, SEPTA then stands as the less-TOD focused case studies.
Background on Case Cities
For the first set of cities with a limited set of existing transit corridors, rising density levels and developing TOD is a means of increasing transit ridership and making it more consistent throughout the day. For the second set of cities, increasing transit service is sometimes seen as a means of increasing density through developing TOD. These two sets of cities, each planning and implementing TOD for their own diametrically polar reasons, often meet in the middle over the vital relationship between transit service and transit-supportive neighborhoods.

Among the two categories of Transit Innovators, it is worth noting two distinct sub-groupings: One of cities that already have developed and established transit assets, and the second of cities that are in the process of developing mass transit systems from scratch. Minneapolis, Cleveland, and Pittsburgh all have existing light rail networks. In the case of Minneapolis, the system began 10 years ago and has expanded rapidly, and is on track to become a comprehensive means of transit for the entire Twin Cities region. The separation in scope and context between Twin Cities Metro and the DART continues to dwindle, and soon Minneapolis could become an Established Leader city. Pittsburgh has two light rail lines developed in the 1980’s, as well as a system of three BRT corridors, including one (the grade-separated East Busway) that is often cited as a TOD case study. The most expensive transit project in Pittsburgh’s history was a $550
million extension of its light rail system across (via bored tunnel) the Allegheny River to downtown’s North Bank in 2004. Cleveland’s Rapid Transit System, on the other hand, has a more complicated historical evolution – marked by optimistic expansions, followed by system closures, loss of state funding support, a struggle to maintain service levels, and intense pressures to implement virtually any cost-saving innovations. Cleveland operates three light rail lines, one heavy rail line (which actually carries the bulk of Rapid Transit ridership) from the 1950s, and two new BRT lines developed in the last ten years. In the particular case of Cleveland, BRT was a means of cutting through cost constraints to develop needed transit corridors.
Funding for Streetcar Systems by Sector Source:

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Among the Transit Innovators, the Emerging Innovators include Cincinnati, Detroit, Kansas City, and Oklahoma City. These four cities, each distinctly different types of Midwestern cities, are all implementing streetcar for relatively similar reasons, but through incredibly different processes and leveraging different resources. For example, federal funding is notably absent in the Oklahoma City Streetcar project, through it was sought. State funding, meanwhile, is notably absent from the Oklahoma City Streetcar, Kansas City Streetcar, and Cincinnati Streetcar. Lastly, city funding (and even involvement) has evaded Detroit’s M-1 Rail project – which has relied primarily on the local non-profit sector to raise the required local match for two separate TIGER grants.
from the Federal Transit Administration. For the other three cities, city funding has been
the primary means of funding, and in Oklahoma City it has been the sole funding source
for lack of state or federal support.

Ranking by mileage:  Ranking by ridership:  Ranking by TOD:

![Charts showing quantifiable differences among Established Leader case studies](image)

Among Established Leader cities, Washington Metro stands as the gold standard for
developing a comprehensive transit system, implementing transit-oriented development,
as well as multimodal connectivity. On all of these fronts, the Washington Metropolitan
Area Transit Authority (WMATA) is farther along in every single quantifiable and
qualitative metric.

Philadelphia is also very similar to Washington, D.C., in fostering widespread transit
connectivity. However, Philadelphia’s context is unique in being more “built-out,” as
North America’s only UNESCO World Heritage City – this has led to intense
concentration of TOD onto certain sites, and limited development programs elsewhere.

Lastly, Dallas is unique within this category, having started from scratch in the 1980s
and since developing its light rail network to be the nation’s largest. Dallas exemplifies
how transit can redevelop and retrofit an entire city at a large scale, in many ways a “scaling-up” of the famous Portland Streetcar TOD “bubble,” yet when considering scale, comprehensiveness, and ridership, it is impossible to not include Dallas among “Established Leaders,” despite being relatively new to transit. SEPTA and TTC both operate historic streetcars and subways, whereas DART and WMATA newer rapid rail (WMATA is heavy rail subway, DART is mixed-grade light rail) as well as modern streetcars opened in the last year.
Chapter 4: Case Studies

The following chart is intended as a cursory resource to compare case study cities on the same quantifiable metrics. Specifically, each transit system is broken down within each case study city – for instance Cleveland’s RTA operates three distinct fixed-guideway systems, including the heavy rail Red Line, the light rail Green and Blue lines, and the BRT Healthline. As one of the purposes of these case studies is to identify differences in TOD impact across transit technologies, it is valuable to break up systems by technology or guideway type. The year that a system first opened will be included to shed light on the historical context of a system, along

Figure 15 Switching from Denton A-Train to Dallas DART LRT while conducting case study visits. N. Emenhiser, January 2016
with track miles and system cost to provide context regarding the scale of the system. Ridership data is compiled from the American Public Transportation Association, and for the purposes of this study, average daily ridership was calculated by taking APTA’s total 2015 ridership counts, divisible by 365. This is to solve the issue of congruency across metrics, as many transit agencies report ridership from a single month, which may not be the same month. Lastly, the TOD information is a binary accounting of whether or not an official TOD implementation policy exists, and the impact metric is a qualitative grade based on physical visits that were conducted to each system throughout the Spring 2016 semester. Each individual case study will also begin with a brief statistical summary, to provide key context reference points.
# Quantifying Transit and TOD Across Case Studies

## Table 2: Key Data Points Quantifying Scale of Transit Systems Within Case Study Cities

<table>
<thead>
<tr>
<th>Case Study City</th>
<th>System Name</th>
<th>Fixed-Guideway Type</th>
<th>Year Implemented</th>
<th>Track Miles</th>
<th>System Cost</th>
<th>Cost/Mile</th>
<th>Ridership 2015</th>
<th>Avg Daily Ridership</th>
<th>TOD Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington</td>
<td>Metrorail</td>
<td>Heavy Rail</td>
<td>1976</td>
<td>117</td>
<td>History</td>
<td>N/A</td>
<td>261,435,200</td>
<td>716,260.822</td>
<td>Yes</td>
</tr>
<tr>
<td>Washington</td>
<td>Streetcar</td>
<td>Streetcar</td>
<td>2016</td>
<td>2.2</td>
<td>$200,000,000</td>
<td>$90,909,091</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>Subway (Broad+Market)</td>
<td>Heavy Rail</td>
<td>1985</td>
<td>25.4</td>
<td>History</td>
<td>N/A</td>
<td>100,093,800</td>
<td>274,229.589</td>
<td>Yes</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>Trolley (Green Lines)</td>
<td>Streetcar</td>
<td>1906</td>
<td>19.8</td>
<td>History</td>
<td>N/A</td>
<td>26,742,500</td>
<td>732,671.233</td>
<td>Yes</td>
</tr>
<tr>
<td>Dallas</td>
<td>DART</td>
<td>Light Rail</td>
<td>1996</td>
<td>90</td>
<td>$4,700,000,000</td>
<td>$52,222,222</td>
<td>30,116,600</td>
<td>82,511.2329</td>
<td>Yes</td>
</tr>
<tr>
<td>Denton</td>
<td>DCTA</td>
<td>Commuter Rail</td>
<td>2011</td>
<td>33</td>
<td>$347,000,000</td>
<td>$10,515,152</td>
<td>557,700</td>
<td>1527.94521</td>
<td>No</td>
</tr>
<tr>
<td>Twin Cities</td>
<td>METRO</td>
<td>Light Rail</td>
<td>2004, 2012</td>
<td>21</td>
<td>$1,720,000,000</td>
<td>$81,904,762</td>
<td>23,003,400</td>
<td>630,230.137</td>
<td>Yes</td>
</tr>
<tr>
<td>Cleveland</td>
<td>Red Line</td>
<td>Heavy Rail</td>
<td>1955</td>
<td>19</td>
<td>History</td>
<td>N/A</td>
<td>6,437,600</td>
<td>1763,72603</td>
<td>No</td>
</tr>
<tr>
<td>Cleveland</td>
<td>Green + Blue Lines</td>
<td>Light Rail</td>
<td>1913, 1996</td>
<td>15.3</td>
<td>History</td>
<td>N/A</td>
<td>2,608,100</td>
<td>1745.47945</td>
<td>No</td>
</tr>
<tr>
<td>Cleveland</td>
<td>Healthline</td>
<td>Bus Rapid Transit</td>
<td>2008</td>
<td>6.8</td>
<td>$200,000,000</td>
<td>$29,411,765</td>
<td>APTA does not track</td>
<td>14,000</td>
<td>No</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>East Busway</td>
<td>Bus Rapid Transit</td>
<td>1983</td>
<td>6.8</td>
<td>$113,000,000</td>
<td>$16,617,647</td>
<td>APTA does not track</td>
<td>14,000</td>
<td>Yes</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>The T</td>
<td>Light Rail</td>
<td>1984, 2011</td>
<td>26.2</td>
<td>$550,000,000</td>
<td>$20,952,366</td>
<td>8,132,900</td>
<td>22281.9178</td>
<td>Yes</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>Streetcar</td>
<td>Streetcar</td>
<td>2016</td>
<td>3.9</td>
<td>$200,000,000</td>
<td>$51,282,051</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
</tr>
<tr>
<td>Detroit</td>
<td>M-1 Rail</td>
<td>Streetcar</td>
<td>2017</td>
<td>3.3</td>
<td>$140,000,000</td>
<td>$42,424,242</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
</tr>
<tr>
<td>Kansas City</td>
<td>Streetcar</td>
<td>Streetcar</td>
<td>2016</td>
<td>2</td>
<td>$102,000,000</td>
<td>$51,000,000</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
</tr>
<tr>
<td>Oklahoma City</td>
<td>Streetcar</td>
<td>Streetcar</td>
<td>2017</td>
<td>4.6</td>
<td>$131,000,000</td>
<td>$28,478,261</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
</tr>
</tbody>
</table>
Figure 16 Nested overview of all ten case studies

- **Established Leaders**
  - Washington, DC
  - Philadelphia, PA
  - Dallas, TX

- **Established Innovators**
  - Twin Cities, MN
  - Cleveland, OH
  - Pittsburgh, PA

- **Emerging Innovators**
  - Cincinnati, OH
  - Detroit, MI
  - Kansas City, MO
  - Oklahoma City, OK
Case: Washington, D.C. (Established Leader)

Table 3 Washington, DC context facts

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Washington, D.C. Metrorail &amp; Streetcar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Agency</td>
<td>WMATA (Washington Metropolitan Area Transit Authority)</td>
</tr>
<tr>
<td>Metrorail Start</td>
<td>1976</td>
</tr>
<tr>
<td>Metrorail Type</td>
<td>Subway (heavy rail)</td>
</tr>
<tr>
<td>Metrorail Scale</td>
<td>117 miles carrying 750,000 daily riders (APTA)</td>
</tr>
<tr>
<td>Streetcar Start</td>
<td>2016</td>
</tr>
<tr>
<td>Streetcar Scale</td>
<td>2.2 miles</td>
</tr>
<tr>
<td>System Hub</td>
<td>Union Station, with transfer stations at Gallery Place, Metro Center, L’Enfant, and Fort Totten</td>
</tr>
<tr>
<td>Regional Planning</td>
<td>Yes, WMATA is a tri-state transit agency</td>
</tr>
<tr>
<td>Other Connected Modes</td>
<td>AMTRAK, commuter rail (MARC), streetcar, bus, bikeshare, bike lanes</td>
</tr>
<tr>
<td>City Transit Ridership</td>
<td>38% (2014 American Community Survey)</td>
</tr>
</tbody>
</table>

TOD Strategy: WMATA’s TOD strategy can be divided along governmental boundaries, with different strategies employed in Maryland, Virginia, and the District of Columbia. The Metro Rail Estate office supports and promotes TOD adjacent to WMATA Metrorail assets, with consulting support from the Center for Transit-Oriented Development. The office has specifically implemented 6 TODs in DC, 3 TODs in Virginia, and 13 TODs in Maryland.

The State of Maryland has three separate TOD programs, including the 2008 TOD Law that identified 14 sites (designated in June 2010) to be eligible for $3 million in dedicated capital funding, to support both planning and implementation aspects.

There is also the Maryland Sustainable Communities Act that authorizes $10 million in grants for historic structures as well as non-historic structures within TOD sites.

Virginia does not have a state-level TOD program, though WMATA does provide
planning grants ranging from $10,000 to $60,000.

Streetcars will play a heavy role in the future of transit in DC. The 2.2-mile “starter line” that connects Union Station to Oklahoma Ave right before the Anacostia River is just the first piece in a $800 million regional streetcar network. The H Street line itself will continue westward across DC, all the way to Georgetown. Georgetown and Benning Road, the opposite ends of this corridor, are similarly unserved by the Metrorail. In this way, while the District Department of Transportation (DDOT) is shifting toward streetcar, this shift still augments the existing Metrorail system despite being a completely different type of system.
<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Street Photo</th>
<th>Aerial Photo (M marks station)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Columbia Heights</td>
<td>Two CDCs were unsuccessful in promoting development prior to 2001 WMATA investment in stations. Since then, 55 projects, over $1 billion total. 3,200 dwelling units and 700,000 sf retail. Station escalators open to corner plaza.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U Street</td>
<td>Major mixed-income development is currently underway. Station site already developed, with Starbucks on corner, and station escalators opening to mid-block plaza.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Washington, DC diagram chart for significant TOD projects

Continued
<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navy Yard</td>
<td>The Yards features 2,700 mixed-income dwelling units, Ballpark District Phase 1 features 830,000 sf of mixed-use, mixed-income development. Station is embedded beneath an air rights development. WMATA renovated station.</td>
</tr>
<tr>
<td>Friendship Heights</td>
<td>TOD straddles DC/MD border on Wisconsin Avenue. “Shops at Wisconsin Place” anchors the Metro station, with escalators opening to corner plaza.</td>
</tr>
<tr>
<td>Downtown Silver Spring</td>
<td>Suburban-styled downtown area with infill opportunities surrounding a new station. WMATA is entering a JED partnership here.</td>
</tr>
</tbody>
</table>
Ravaged by riots in 1968, this neighborhood was subject to decades of failed revitalization efforts before transit reached the neighborhood, including the creation of two redevelopment authorities (RLA, NCRC), due to the neighborhood’s struggling economic base and subpar purchasing power.

According to a MNCPPC presentation, WMATA’s investment of over $500 million to extend the Metrorail, and the District’s provision of $48 million of TOD subsidy, resulted in over $1 billion in development spread across 55 development projects, including destination retail, services (grocery store, Target), theaters, restaurants, and housing. 20% of new housing product is affordable.
Case: Philadelphia, PA (Established Leader)

Table 5 Philadelphia, PA context facts

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Philadelphia SEPTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Agency</td>
<td>Southeastern Pennsylvania Transportation Authority</td>
</tr>
<tr>
<td>Subway Start</td>
<td>1965</td>
</tr>
<tr>
<td>Subway Type</td>
<td>Subway (heavy rail)</td>
</tr>
<tr>
<td>Subway Scale</td>
<td>25.4 miles carrying 274,230 daily riders (Market/Broad)</td>
</tr>
<tr>
<td>Trolley Start</td>
<td>1906</td>
</tr>
<tr>
<td>Trolley Type</td>
<td>Streetcars in mixed-traffic and grade-separated (Center City)</td>
</tr>
<tr>
<td>Trolley Scale</td>
<td>19.8 miles carrying 73,267 daily riders (Green Lines)</td>
</tr>
<tr>
<td>System Hub</td>
<td>Market + Broad Station, beneath Philadelphia City Hall</td>
</tr>
<tr>
<td>Regional Planning</td>
<td>Yes</td>
</tr>
<tr>
<td>Other Connected Modes</td>
<td>AMTRAK, commuter rail (PA), bus, bikeshare</td>
</tr>
<tr>
<td>City Transit Ridership</td>
<td>26.5% (2014 American Community Survey)</td>
</tr>
</tbody>
</table>

TOD Strategy: The Commonwealth of Pennsylvania offers a legal framework for Transit Revitalization Investment Districts (TRID), which was created in 2004 to grease efforts to better leverage transit assets for community revitalization. The program is unique as a holistic TOD policy, with support for planning, land assembly, and implementation – the three major areas of TOD policy. To assist with planning, there are grants available; to assist with land assembly, there are incentives for transit agencies to partner with master developers toward activating excess land; to assist with development, there is a value capture mechanism that works similarly to TIF.

In the Philadelphia region, the lead agency on TRID initiatives is the Delaware Valley Regional Planning Commission. The DVRPC region has 7 TRID initiatives as of March 2016, including 2 in Philadelphia at W. 46th and Market and another at Temple...
University, and 3 in Montgomery County’s historic “Main Line” suburbs – Bryn Mawr, Ambler, and Abington. Additionally, there are TRID projects in the works in Bristol Township in Bucks County as well as Marcus Hook in Delaware County.

The Temple University TRID stands as a case study, along with an additional TOD project surrounding the 30th Street Station, which is Philadelphia’s multi-modal transit hub. In these areas, the market is strong, buoyed by proximity to downtown, diverse neighborhoods, and a large student population at Temple University and University of Pennsylvania. The market is even stronger in Montgomery County – but with relatively homogenous upper-income demographics, many areas do not qualify for TIF under Pennsylvania law (requires declaration of blight or distress). This makes the value capture mechanism through TRID especially meaningful. Lastly, the market in Marcus Hook is significantly weaker, as an aging post-industrial community closer to Wilmington, Delaware. In the case of Marcus Hook, pursuing a TRID initiative brought forth planning grants from the Commonwealth of Pennsylvania, allowing it to pursue an economic development opportunity that otherwise would have been inaccessible.
Table 6 Philadelphia, PA TOD diagrams

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Street Photo</th>
<th>Aerial Photo (Marks station)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temple University</td>
<td>TRID plan covered both Temple and W. 46th and Market TOD sites. At Temple, TRID led to a LEED platinum mixed-income housing project called Paseo Verde, with a medical center, pharmacy, and community center.</td>
<td>(Photo from the National Council of La Raza 2016)</td>
<td></td>
</tr>
<tr>
<td>30th Street Station District</td>
<td>The 88-acre rail yard behind 30th Street Station, and surrounding land, will give way to 18 million sq.ft. of new TOD, involving a partnership between Drexel University, Brandywine Realty, SEPTA, and AMTRAK. This will be the largest TOD on AMTRAK’s Northeast Corridor.</td>
<td>(Rendering from Skidmore, Owings, &amp; Merrill 2016)</td>
<td></td>
</tr>
</tbody>
</table>
Case: Dallas, TX (Established Leader)
Table 7 Dallas-Denton, TX context facts

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Dallas DART</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Agency</td>
<td>Dallas Area Rapid Transit</td>
</tr>
<tr>
<td>DART Start</td>
<td>1996</td>
</tr>
<tr>
<td>DART Type</td>
<td>Light rail, grade-separated</td>
</tr>
<tr>
<td>DART Scale</td>
<td>90 miles carrying 82,511 daily riders</td>
</tr>
<tr>
<td>Streetcar Start</td>
<td>1989 McKinney Avenue, 2016 Oak Cliff</td>
</tr>
<tr>
<td>Streetcar Type</td>
<td>Streetcar in mixed traffic</td>
</tr>
<tr>
<td>Streetcar Scale</td>
<td>1.6 miles Oak Cliff Streetcar, 4.6 miles McKinney Avenue</td>
</tr>
<tr>
<td>System Hub</td>
<td>Union Station (Oak Cliff Streetcar), Pacific Avenue transit mall (DART), and City Place (DART +)</td>
</tr>
<tr>
<td>Regional Planning</td>
<td>Yes, DART leverages a regional sales tax</td>
</tr>
<tr>
<td>Other Connected Modes</td>
<td>AMTRAK, commuter rail (DCTA, TRE), bus, bikeshare</td>
</tr>
<tr>
<td>City Transit Ridership</td>
<td>4.1% (2014 American Community Survey)</td>
</tr>
</tbody>
</table>

TOD Strategy: Capturing more of North Texas’ rapid growth along DART assets is a major policy goal of DART, the City of Dallas, and the regional council of governments. Chief among these stakeholders is the North Central Texas Council of Governments (NCTCOG) Sustainable Development Funding Program. This program allows cities to apply for TOD planning or implementation grants that can be “swapped” for federal funding that said city would receive through the CMAQ (Congestion Mitigation and Air Quality) and STP (Surface Transportation Program) programs.
The Sustainable Development Funding Program (SDFP) was created in 2001 by the council of governments’ policy body, the Regional Transportation Council, and has since had three calls for projects in 2001, 2005, and 2010. The grants have totaled $124 million. These funds have gone toward infrastructure projects, landbanking projects, and planning projects. Projects submitted are then competitively scored. A screening form shows how the following four questions were uniformly applied to evaluate proposals:

1. Is the facility eligible? The facility needs to be eligible for CMAQ and/or STP funds, and also meet the policy objectives of the Regional Transportation Council.

2. Is the facility strategies? The SDFP investment needs to meet foreseeable transportation needs of the project, there should be consensus between public and private partners, the transportation facility should relate to the proposed land use, and transit operating costs should be covered by a transit service provider (DART).

3. Is the facility cost effective? The cost should be reasonable and funds should match the project’s impact.

4. Is funding available? Projects can be funded with STP or CMAQ funds under either Eastern (Dallas) or Western (Fort Worth) sub-region allocations.
The 2001 Call for Projects made $40 million in awards, including two (2) projects in Dallas – Victory Plaza, northwest of downtown, and the Cedars Station, south of downtown. Beyond the Dallas projects, awards were also made for The Colony (Austin Ranch), Denton (Sundown Ranch), Frisco (Frisco Square), Irving (Northwest Corridor), McKinney (Craig Ranch), and Plano (Plano Transit Village). It is worth noting that McKinney, The Colony, and Frisco are not even served by the DART, and at the time Denton was not connected, either. The projects in McKinney, The Colony, and Frisco make an argument for congestion mitigation through mixed-use development programming, whereas the Denton project appears to be a large single family subdivision.

The 2005 Call for Projects awarded $40 million to 41 different projects, including 7 in Dallas. The Dallas awards include $450,000 to Cityville at Carlisle, $1.65 million to Cityville at Southwestern Medical District, $829,000 for Dallas Design District pedestrian/bicycling improvements, $300,000 to Eastside Commons Plaza, $2.8 million to Fiji/Compton Sustainable Development Project, $1.6 million to Mockingbird Plaza, and $450,000 for Cross Street Sidewalk Reconstruction over the Woodall Rodgers Freeway. Additionally, DART received 3 awards for the Park Lane LRT Station Pedestrian Overpass, Pedestrian and Bicycle Access at Meadow Road, and the Las Colinas Urban Center LRT Station. In this round, all of the projects appear to be unquestionably transit-oriented.
The 2010 Call for Projects awarded another $43 million to support 26 infrastructure and planning projects. It is also highly noteworthy that at the time of this funding round, some Dallas suburbs served by DART (notably Lewisville) have shifted to the Western District sub-region allocation pool. This puts them in a funding pool with Fort Worth and the rest of the western Metroplex, and apart from Dallas and its suburbs.

This round funded 8 projects in Dallas, including the Atmos Lofts, The Continental, Edison/Hi Line Stemmons Rail/Transit Underpass, Lake Highlands TOD, Omni Hotel and Convention Center Station, The Collective, Zang Triangle, and Routh Street Arts District Gateway. The 2010 round also funded single projects for Mesquite, McKinney, Farmers Branch, Duncanville, Carrollton, and Addison.

Of these three rounds, 8 projects will be pictured in the photo gallery below: Victory (Dallas), Mockingbird Station (Dallas), Park Lane (Dallas), and Downtown Carrollton. Victory and Mockingbird will be detailed.
### Table 8 Dallas, TX TOD diagrams

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Major TOD Projects</th>
<th>Street Photo</th>
<th>Aerial Photo (Marks station)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mockingbird Station</td>
<td>Built in 2001; first TOD in the State of Texas. This $90 million development includes a DART station and 560,000 sq.ft. of commercial and residential space, including over 200 loft apartments in a historic warehouse that was saved.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victory Park</td>
<td>Victory Park is a master-planned development on 75 acres north of the West End in Downtown Dallas. This project, half-way complete now, will include 4,000 residences and 4 million sq.ft. of office and retail space. It is anchored by the American Airlines Center arena.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TOD Strategy: The main policy goal of TOD programs surrounding the Metro is to leverage market value to support large-scale affordable housing production. Toward this goal, the Twin Cities Metro is the only transit system augmented with TOD programs at the local, regional, state, and non-profit level. These programs all cover the range of planning, property acquisition, and implementation.

At the local level, both the City of Minneapolis and Hennepin County have TOD programs. Hennepin County’s program is the Transit-Oriented Development Bond Program, which has awarded over $13 million since 2003, a year before the first Metro line was up and running. The city also offers the Capital Acquisition Revolving Fund,
which includes $1 million in Community Development Block Grant (CDBG) dollars and comes with the stipulation that 20% of housing units be set-aside for less than 50% area median income (AMI).

The Metropolitan Council offers Livable Communities Transit-Oriented Development Grants, which fund infrastructure projects or property acquisition. There are two facets of this program: 1, the Livable Communities Demonstration Account (LCDA) funds infrastructure projects that connect the dots between development and transit; 2, the Tax Base Revitalization Account (TBRA) funds clean-up and acquisition of brownfield sites for developments that break ground in 3 years and either provide job growth or production of affordable housing.

The State of Minnesota also offers two programs, one for property acquisition and another for implementation. Land Acquisition for Affordable New Development (LAAND) is a partnership between the Metropolitan Council, Minnesota Housing, and the Family Housing Fund; LAAND provides loan financing for land acquisition to develop affordable housing in growing areas with transit access, with the goal of maximizing affordable and minimizing vehicle miles traveled. Transit Improvement Areas (TIA) is a loan program through the Minnesota Department of Employment and Economic Development to finance TOD projects that increase transit ridership.

Lastly, the most significant TOD program in this space is the Central Corridor Funders Collaborative – a non-profit initiative to preempt gentrification displacement and
instead leverage the Metro light rail as a development mechanism for affordable communities. While the Funders Collaborative has raised $5 million for its Catalyst Fund, they expect to invest $20 million over the next 10 years, and support the formation of spin-off partnerships at the same time. As a trial run program, the initiative does not have established targets for affordable housing or job production, and has a ten-year sunset. Similar to Hennepin County’s bond program, this initiative was established in 2007, before the Green Line “Central Corridor” had broken ground – their “investment strategy,” supported by an inventory of potential TOD sites along the corridor, was formed in 2009.
<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Street Photo</th>
<th>Aerial Photo (M marks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midway Station (St. Paul)</td>
<td>Episcopal Homes of Minnesota opened this $45 million senior affordable project a year after the Green Line opened. It includes The Gardens (designed to emulate a home), Midway Pointe, and The Terrace.</td>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Lake Street Station Apartments</td>
<td>The school district sold an underutilized site to be developed into 64 units of senior affordable housing, with 5,200 sq.ft. commercial space on the ground floor. $10.5 million project is directly adjacent to the Blue Line station at the gateway to Midtown.</td>
<td></td>
<td>M</td>
</tr>
</tbody>
</table>
Case: Cleveland, OH (Established Innovator)

Table 11 Cleveland, OH context facts

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Cleveland RTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Agency</td>
<td>Greater Cleveland Rapid Transit Authority</td>
</tr>
<tr>
<td>Red Line Start</td>
<td>1955</td>
</tr>
<tr>
<td>Red Line Type</td>
<td>Heavy rail, grade-separated</td>
</tr>
<tr>
<td>Red Line Scale</td>
<td>19 miles carrying 17,637 daily riders</td>
</tr>
<tr>
<td>Blue/Green Line Start</td>
<td>1913, with Waterfront Line extension in 1996, dedicated ROW</td>
</tr>
<tr>
<td>Blue/Green Line Type</td>
<td>Light rail</td>
</tr>
<tr>
<td>Blue/Green Line Scale</td>
<td>15.3 miles carrying 7,145 daily riders</td>
</tr>
<tr>
<td>Healthline Start</td>
<td>2008</td>
</tr>
<tr>
<td>Healthline Type</td>
<td>Bus rapid transit, dedicated right-of-way</td>
</tr>
<tr>
<td>Healthline Scale</td>
<td>6.8 miles carrying around 14,000 daily riders (no APTA source)</td>
</tr>
<tr>
<td>System Hub</td>
<td>Tower City / Public Square</td>
</tr>
<tr>
<td>Regional Planning</td>
<td>No</td>
</tr>
<tr>
<td>Other Connected Modes</td>
<td>Bus</td>
</tr>
<tr>
<td>City Transit Ridership</td>
<td>10.6% (2014 American Community Survey)</td>
</tr>
</tbody>
</table>

TOD Strategy: Neither the City of Cleveland, RTA, Cuyahoga County, Northern Ohio Areawide Coordinating Agency (NOACA), nor the State of Ohio currently have a comprehensive TOD strategy for Cleveland. However, RTA is beginning to develop organizational capacity to pursue PPP strategies, and NOACA is beginning to conduct comprehensive inventories of TOD opportunities. NOACA offers a program to support small planning grants through the Transportation for Livable Communities Initiative (TLCI), which Reconnecting America counts as Ohio’s only TOD program. TLCI awards roughly $1 million annually with awards capped at $75,000. There are
no programs for land acquisition or implementation/development, and RTA itself does not have an office dedicated toward TOD. There is no TOD strategy for Cleveland and all of its fixed guideway assets.

Despite the lack of planning for TOD, Cleveland has successfully implemented a great deal of TOD due to several large institutions located along its transit corridors. Specifically, the Healthline BRT directly serves the Cleveland Clinic and Case Western Reserve University in University Circle, which alone has benefited from $4 billion in TOD.

Transit corridors do not engender that type of market response once they fan out from downtown or University Circle. The Red Line is particularly underutilized as a community development asset – despite the highest ridership of any transit corridor in Cleveland, its grade-separated trench has stifled potential development impact. For lack of public support for TOD, Red Line TOD has been slow-going, with several large projects running behind schedule.
Table 12 Cleveland, OH TOD diagrams

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Street Photo</th>
<th>Aerial Photo (marks station)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flats East Bank</td>
<td>$500 million project with 240 dwelling units, 150 hotel rooms, 500,000 and sq.ft. commercial space. Rehabilitation of a former brownfield site and increasing access to the riverfront were goals of this project, which utilized TIF and EB-5 visa financing.</td>
<td><img src="image1.jpg" alt="Street Photo" /></td>
<td><img src="image2.jpg" alt="Aerial Photo" /></td>
</tr>
<tr>
<td>Euclid Commons</td>
<td>Built in 2010, 2 years after the Healthline, this 601-bed student housing projects sits across from Cleveland State University with its own BRT station at E. 24th. It also includes retail storefronts.</td>
<td><img src="image3.jpg" alt="Street Photo" /></td>
<td><img src="image4.jpg" alt="Aerial Photo" /></td>
</tr>
</tbody>
</table>
Case: Pittsburgh, PA (Established Innovator)

Table 13 Pittsburgh, PA context facts

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Pittsburgh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Agency</td>
<td>Port Authority of Allegheny County</td>
</tr>
<tr>
<td>‘T’ Start</td>
<td>1984</td>
</tr>
<tr>
<td>‘T’ Type</td>
<td>Light rail, grade-separated</td>
</tr>
<tr>
<td>‘T’ Scale</td>
<td>26.2 miles carrying 22,281 daily riders</td>
</tr>
<tr>
<td>East Busway Start</td>
<td>1983</td>
</tr>
<tr>
<td>East Busway Type</td>
<td>Bus rapid transit, bus-only highway</td>
</tr>
<tr>
<td>East Busway Scale</td>
<td>6.8 miles carrying 14,000 daily riders</td>
</tr>
<tr>
<td>System</td>
<td>No</td>
</tr>
<tr>
<td>Regional</td>
<td>County-level</td>
</tr>
<tr>
<td>Other Connected</td>
<td>Bus, Amtrak, bikeshare, incline rail</td>
</tr>
<tr>
<td>Modes</td>
<td></td>
</tr>
<tr>
<td>City Transit Ridership</td>
<td>16.9% (2014 American Community Survey)</td>
</tr>
</tbody>
</table>

TOD Strategy: While the city does not have a city-wide or system-wide policy or plan to support TOD, the city and the county Port Authority have proactively partnered toward small-area plans to support TOD at specific nodes, not unlike other case studies with or without comprehensive system-wide TOD strategies. The primary node for light rail TOD is the North Shore of the Allegheny River, where the T now terminates after a $550 million extension across the river to serve several stadiums and museums. In addition to the North Shore, the primary node for BRT-related TOD has been in East Liberty, which is a quickly-revitalizing business district on the east side.
Both of these nodes represent the best opportunities for TOD along either network, due to the grade separation of most of Pittsburgh’s fixed-guideway transit network. In the case of the T, the light rail only traverses city streets in select residential neighborhoods in the South Hills; in the downtown “Triangle” the T is an underground subway, which then emerges north of the river on a viaduct where it terminates.

In the case of the East Busway, the entire route is removed from city streets, operating in a trench – East Liberty occupies a strategic intersection right beside the BRT station, in addition to its legacy as a historic business district. Most of East Liberty’s revitalization has been supported by the public sector independently of TOD strategies; historic building stock has been rehabilitated with federal tax credits, New Markets Tax Credits have supported a new Whole Foods and Target, and HUD has invested both a CHOICE Neighborhoods Planning and Implementation Grant into the nearby Larimer housing project. East Liberty has also seen market-rate and mixed-income housing built in recent years. The city is pursuing a Transit Revitalization Investment District (TRID) similar to Philadelphia. According to the CTOD planning study for the TRID, a primary motivation in pursuing TRID is the ability to leverage tax abatement as the City of Pittsburgh is maxed-out on its TIF capacity (Commonwealth law limits this to 10% of taxable property within a taxing district).
This BRT station has been surrounded by new TOD – spurred by BRT station improvements funded by a $15 million TIGER grant. New Target and 3 new housing projects, along with the restoration of historic storefronts that were retained. Bakery Square, an iconic historic adaptive reuse project, is also 2 blocks away although not directly-adjacent.
Case: Kansas City, MO (Emerging Innovator)

Table 15 Kansas City, MO context facts

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Kansas City Streetcar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Agency</td>
<td>Kansas City Area Transit Authority</td>
</tr>
<tr>
<td>Streetcar Start</td>
<td>2016</td>
</tr>
<tr>
<td>Streetcar Type</td>
<td>Streetcar in mixed traffic</td>
</tr>
<tr>
<td>Streetcar Scale</td>
<td>2 miles – ridership unknown (opens 2016)</td>
</tr>
<tr>
<td>System Hub</td>
<td>Union Station – Crown Center</td>
</tr>
<tr>
<td>Regional Planning</td>
<td>No</td>
</tr>
<tr>
<td>Other Connected Modes</td>
<td>AMTRAK, bus, bikeshare</td>
</tr>
<tr>
<td>City Transit Ridership</td>
<td>3.3% (2014 American Community Survey)</td>
</tr>
</tbody>
</table>

TOD Strategy: As this system is under development, the city and other related stakeholders have yet to form a specific TOD strategy. The City of Kansas City has a TOD policy of supporting TOD, broadly speaking. This policy includes directives to undergo station-area plans and to refine zoning through the application of a TOD overlay. Under finance, the document expresses support for and interest in value share mechanisms. Additionally, they have the ability to offer Enhanced Enterprise Zone (EEZ) incentives in the form of 100% tax abatement.

The city’s TOD policy also explores the possibility of developing a TOD fund in the future. Denver is cited as their model in this instance, where the Denver Urban Land Conservancy exists as the city’s TOD fund – which has also won a $3 million HUD
Challenge Grant. Kansas City is exploring a similar TOD fund in partnership with community development stakeholders such as Kansas City LISC or national foundations involved in TOD, such as the Ford Foundation and MacArthur Foundation.

It is noteworthy to stress the comprehensiveness of Kansas City’s tentative TOD planning, which would also apply to the city’s 3 BRT corridors, in addition to the new streetcar corridor.
Table 16 Kansas City, MO TOD diagrams

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Street Photo</th>
<th>Aerial Photo (Marks station)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power + Light District</td>
<td>This $850 million development, anchored by the Sprint Center arena and H&amp;R Block HQ and several historic landmarks, finished phase 1 in 2008. Phase 2, enabled by streetcar, includes two new apartment high-rises.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1914 Main</td>
<td>1914 Main is a typical urban infill project, offering 44 units for around $2 / sq.ft. What is unique about this project is its developer, Linden Street Partners from Denver, who was enticed to Kansas City by the opportunity to engage in TOD. The project received a 95%, 10-year tax abatement.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(KEM Studio 2015)
Case: Cincinnati, OH (Emerging Innovator)

Table 17 Cincinnati, OH context facts

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Cincinnati Streetcar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Agency</td>
<td>Southwest Ohio Regional Transit Authority</td>
</tr>
<tr>
<td>Streetcar Start</td>
<td>2016</td>
</tr>
<tr>
<td>Streetcar Type</td>
<td>Streetcar in mixed traffic</td>
</tr>
<tr>
<td>Streetcar Scale</td>
<td>3.9 miles – ridership unknown (opens 2016)</td>
</tr>
<tr>
<td>System Hub</td>
<td>None</td>
</tr>
<tr>
<td>Regional Planning</td>
<td>No</td>
</tr>
<tr>
<td>Other Connected Modes</td>
<td>AMTRAK, bus, bikeshare, bike lanes</td>
</tr>
<tr>
<td>City Transit Ridership</td>
<td>7.9% (2014 American Community Survey)</td>
</tr>
</tbody>
</table>

TOD Strategy: In the case of Cincinnati, before TOD can be hatched, there must be transit infrastructure – the development of which has been a saga. The 3.9 mile streetcar has been subject to political turmoil, as the project of one mayor, and the rallying cry of another. Current mayor John Cranley has made defeating the Cincinnati streetcar his top priority, so that the funds could be reallocated to widening auto-only thoroughfares and fixing related potholes. On top of this, Governor Kasich’s administration pulled funding previously committed by former Governor Strickland’s administration – resulting in a major reduction in scope, severing a connection to the University of Cincinnati in Uptown. The streetcar project only commenced through all of this turbulence upon the discovery that canceling various construction and union labor contracts would actually come at a higher cost.
Now that the streetcar is mere months from opening, the debate has shifted to its operations. SORTA was initially opposed to operating the streetcar in addition to its existing bus routes. SORTA has continued to conduct hostile push-polling directed at households in the Greater Cincinnati area. As of March 2016, the frequency of operation is currently unsettled due to conflicts over whether the streetcar, connecting the river to the north end of Over-the-Rhine, should operate frequently and/or during major events. Consistent streetcar opponents are trying to force a shut-down of the streetcar during major events. Indeed, no other transit project profiled amongst these case studies has been so embroiled in controversy at every step along the way.

Despite all of this, and the obvious factors inhibiting the city from going further in devising a TOD policy, there are high-capacity, non-profit actors working on TOD along the route. In fact, there has already been a strong market response while the route is still under construction. Not only does this market response include development projects that are denser than was previously feasible, but more meaningfully forebodes the revitalization of Over-the-Rhine north of Liberty Street. While Over-the-Rhine has become one of the nation’s hottest historic districts, most of this investment has been concentrated south of Liberty. A few specific projects include restoration of an Italianate-style block adjacent to the landmark Findlay Market, apartments across the street, and the new Rhinegeist Brewery two blocks to the north. These three projects alone solidify Race Street as a veritable beacon of economic development for this increasingly diverse neighborhood.
Over-the-Rhine will be key toward the success of the streetcar. Already known as a success story, the neighborhood is the nation’s largest National Register Historic District, based off of volume of contributing properties – meaning there are voluminous opportunities for redevelopment, even without displacing anyone currently housed in this mixed-income neighborhood. Over-the-Rhine has benefited in particular from the involvement of the Cincinnati Center City Development Corporation, or 3CDC, and its subsidiary Cincinnati New Markets Fund. Over-the-Rhine has seen countless applications of Historic Tax Credits (state and federal), New Markets Tax Credits (NMTC), and Low-Income Housing Tax Credits (LIHTC). While the city may not be poised to creating additional development incentives specifically for TOD, that the route is so closely intertwined with this particular neighborhood fabric, will bode well for TOD in the long run.
Table 18 Cincinnati, OH TOD diagrams

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Major TOD Projects</th>
<th>Aerial Photo (M marks station)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMHA</td>
<td>The housing authority has proposed this project, on one of the most-prime streetcar parcels, on the Central Parkway in between Race and Vine. The project will include mixed-income housing and a grocery store.</td>
<td>(Cincinnati Metropolitan Housing Authority 2016)</td>
<td>(Cincinnati Metropolitan Housing Authority 2016)</td>
</tr>
<tr>
<td>General Electric</td>
<td>GE’s 338,000 sq.ft. Global Operations Center anchors The Banks, just south of downtown on the river. This project, creating 2,000 new jobs on the streetcar corridor, would not have come to Cincinnati if not for the streetcar (according to GE).</td>
<td>(UrbanCincy.com 2016)</td>
<td>(UrbanCincy.com 2016)</td>
</tr>
</tbody>
</table>
TOD Strategy: The M-1 Rail project projects $3 billion in development and 10,000 new housing units over the next 10 years as a result of the $140 million transit project. According to the M-1 Rail implementation office, nearly $1 billion in development has already been completed along the line since it was announced, and there is an additional $60 million in development currently underway. The project has paid special attention toward exceeding minority hiring requirements, by committing $40 million of the $140 million project in contracts with Detroit-based and certified diversity business enterprise (DBE) businesses.
Despite the specific impact already-achieved and projected, there is not a TOD program in place. In fact, the City of Detroit is not even a financial participant to this project, with all funds coming from Wayne County, State of Michigan, Federal DOT, and foundations that stood-in as the local match. This arrangement with foundations taking the city’s place in raising a local match was only made possible by Congressional action. Given the city’s non-participant status with regards to this project, and the fact that it will be operated by the suburban RTA (SMART) because it is better-funded, the city may not see itself as having skin in the game. It remains to be seen what level of interest there is in establishing wraparound TOD programs to ensure success as well as equity on that metric.
### Table 20 Detroit, MI TOD diagrams

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Major TOD Projects</th>
<th>Aerial Photo (M marks station)</th>
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</thead>
<tbody>
<tr>
<td>Whole Foods</td>
<td>Whole Foods took a gamble on a Detroit location, on the M-1 Rail adjacent to Wayne State University. The 21,000 sq.ft. store received $4.2 million in brownfield tax credits as well as $1 million in incentives from the Michigan Economic Development Corporation.</td>
<td>![Street Photo](Google Streetview 2016)</td>
<td>![Aerial Photo](Olympia Development 2016)</td>
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<tr>
<td>District Detroit</td>
<td>This project, on track to open in 2017, surrounds the new $627 million Red Wings Arena with 300-450 hotel rooms, 150 residential units, and 200,000 sq.ft. commercial space. 20% of housing built on-site will be designated as affordable.</td>
<td>![Street Photo](Olympia Development 2016)</td>
<td>![Aerial Photo](Olympia Development 2016)</td>
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</table>
TOD Strategy: Oklahoma City has utilized tax-increment financing (TIF) extensively, more so than other cities, for lack of political pressure or legal constraints at this point in time. There is a long-standing practice of blanketing the center city with TIF districts, and carving a new TIF district out of the existing pattern, or awarding TIF proceeds from the blanket district to smaller projects within the boundaries. The city is using cash proceeds from a sales tax initiative (rather than any bonding mechanism) to cover infrastructure costs of the new streetcar, which frees its value capture potential to support additional TOD as well as operations, which remain unsettled (not unlike other streetcar systems).

This project is part of Oklahoma City’s “MAPS 3” package, a reference that stands for “Metropolitan Area Projects,” which is a popular capital investment program that
began in 1993. Oklahoma City traces its improvements in quality of life and economic development to the continued passage of these “log-rolling” ballot initiatives. The most recent, the third iteration of the program, will extend a 1-cent sales tax for 7 years to generate $777 million for a new convention center, the streetcar, river boathouses and improvements, a new downtown central park, a state fairgrounds expo center, senior centers across the city, and filling in gaps in the sidewalk and multi-use trail network. The second MAPS package focused solely on rebuilding the inner city schools, whereas the first MAPS package focused solely on jumpstarting downtown. It can be said that this third iteration of the program is focused on active lifestyle amenities, which the city was previously lacking.

The below map from The Alliance for Economic Development, the city’s recently-privatized economic development agency, shows the synergy between the streetcar route and existing TIF projects. It can be reasonably expected that TOD implementation will follow a similar strategy and pattern.
Figure 18 Map showing streetcar route and PPP projects. (The Alliance for Economic Development 2015)
Eight Strategies For Successful TOD Implementation

Across these sixteen (16) case study transit systems, located in ten (10) different case cities, emerges a distinct picture of innovation that reinforces the role of the local level as policy laboratories. All of these cities, and in some cases different transit systems within the same city, employ different tools to further the TOD impact of their transit system. All of these realize that there is an extent to which transit assets naturally make an already-attractive area even-more attractive for development – however the goal of almost all of these TOD programs is to influence that development pattern, either to bring it into economically-distressed areas or to encourage affordability amongst developments.

It is also worth noting that cities with newer transit systems typically have more innovative TOD policies. In the case of Dallas and Minneapolis-St. Paul, both rapidly-growing metropolitan areas that anchor opposite ends of the I-35 corridor (generally newer cities), which have developed a robust package of TOD programs. Even within these two similar case cities – resembling cities that begun rail transit recently (1996 in Dallas, and 2004 in Minneapolis) yet have quickly developed large, comprehensive systems – there are some key differences. In Dallas, TOD programs have been developed exclusively at the local and regional levels (demonstrating a lack of state support), largely driven by congestion mitigation and air quality, and designed to
support the regional-scale at which DART leverages funding (member cities in Dallas and Collin counties). Whereas in the Twin Cities, TOD programs have been developed comprehensively at the local, regional, and state levels (demonstrating all-around political support for transit and urban development), largely driven by affordable housing goals, and designed to support just the anchor cities within the region. While NCTCOG (Dallas) is funding projects in over a dozen municipalities, the Metropolitan Council (Twin Cities) is funding projects solely in Minneapolis, St. Paul, and Bloomington.

Among older systems, such as Philadelphia and Cleveland, these are the cities where TOD is the most limited. This is due in part to the following: 1, older build-out of areas adjacent to fixed-guideway routes; 2, weaker real estate markets in both cities compared to other case studies; and 3, transit corridors that may not necessarily be development-oriented themselves.

Regional-Scale Planning
Transportation patterns are not confined by municipal boundaries. This is why highway planning is almost always undertaken at the regional and state level, and transit planning should be no different, especially if it aspires to be remotely comparable in scope and impact. Some case study communities exemplify regional-scale planning, whereas others exemplify the lack thereof.
Among cities with developed transit networks, Cleveland is foremost for lacking regional-scale planning. While the Rapid extends into East Cleveland and fully serves the affluent historic streetcar suburb of Shaker Heights, this is the full extent of regional impact outside of Cleveland proper, which is a city often pitted against its neighbors. As a city of 396,000 in a county of nearly 1.3 million, the clout is on the side of the suburbs that surround Cleveland.

An especially unique case of foregoing regional planning is Detroit, where Detroit City operates the Detroit Transit Authority, while the rest of surrounding Southeast Michigan operates the Suburban Mobility Authority for Regional Transportation (SMART). Smart as it may call itself, this further reinforces the extent to which Detroit City has become a far-southeastern suburb of its own metro. To mitigate this, the better-funded SMART has been making service inroads into Detroit City itself, including offering to operate the new M-1 Rail project in Detroit itself – keeping streetcar operational costs from hitting the already cash-strapped city that has been forced to harshly cut city services.

All of the newly-developed streetcar systems, limited as they are in scope, also exemplify a lack of regional planning. As many of these systems functionally operate as neighborhood circulators, the benefits are heavily-localized to areas along the route that may serve as a parking/pedestrian “extender,” or that see TOD infill. Along with the lack of regional scale and planning, none of these systems have a regional funding mechanism like almost all heavy- and light-rail systems do.
On the other hand, Philadelphia, Twin Cities, and Dallas best exemplify regional-scale planning, at least among the case cities for this study. In addition to the regional-scale components already mentioned with Dallas and the Twin Cities, Philadelphia benefits from a comprehensive, 450-mile regional rail network of which the subway and trolley lines are a mere component. This expansive SEPTA rail network leverages a funding mechanism across Southeast Pennsylvania, which it then serves uniformly with rail—leaving few places in Southeast Pennsylvania unserved by rail specifically.

TOD Incentive Programs
Minnesota proves the extent to which state government can be effective in influencing local urban development, with programs for both TOD land acquisition and TOD implementation. Both of these programs provide low-interest bond financing for TOD that specifically furthers the community’s goals of affordable housing. These programs can partner with the Metropolitan Council, which is already an extensive land owner along its rail corridors.

NCTCOG’s Sustainable Development Funding Program has also been highly effective in incentivizing the real estate market to move toward transit. Throughout the three separate funding rounds since the program’s inception, it is worth noting how the program and its grant recipients have evolved. While the grants are detailed in the case study, it is worth pointing out that grant-worthiness of recipients has increased tremendously as the program has grown. In the first round, when DART rail was still
“new-fangled,” some grants went to pioneering TOD, while others went to greenfield subdivisions that could creatively argue their case for sustainability; the latter of which quickly evaporated among subsequent funding rounds. Where it stands today, the Sustainable Development Funding Program funds high-quality TOD with a strong nexus to transit, and has even been successful in jump-starting “transit villages” in suburban communities.

Multi-Modal Connections
As all of these transit systems were parsed out as separate case studies, including 2 in Washington, DC., 2 in Philadelphia, 3 in Cleveland, and 2 in Pittsburgh – these systems dually must stand on their own and also connect with a larger network in order to achieve success. It goes without saying that the farther that people can travel on a system, the higher ridership will be. This is exemplified by the 3 systems with over 80,000 daily riders – Washington (Metrorail), Philadelphia (SEPTA subway), and Dallas (DART rail). From the Metrorail, riders can seamlessly ride into three different states (including the District of Columbia); from SEPTA riders can seamlessly ride into three different states as well; and from DART riders can seamlessly ride into three different counties – all of these systems connect a downtown to an airport, and all of these systems weave together a tapestry of income-diverse communities.

Among new transit starts, specifically cities embarking on streetcar projects, there is a real opportunity for multi-modal connections to enhance ridership and impact. This will be especially important due to the limited scale of all of these “starter streetcar”
systems. In particular, the Cincinnati streetcar has no broader transit network, besides a network of city buses, to which it can connect. The Oklahoma City streetcar connects to an Amtrak station where commuter rail is being developed; however, that is awaiting passage of a regional funding mechanism – Oklahoma City’s streetcar is much more of a first mile than a last mile. Kansas City’s streetcar connects to one of the nation’s busiest Amtrak stations, as well as 3 separate BRT-lite corridors – and while small in scale, fully serves the central core (River Market, Downtown, Crossroads, and Crown Plaza districts). Rounding out the streetcar case studies as the most-connected is the M-1 Rail in Detroit, which connects twice to the monorail People Mover (once at the Grand Circus and again at the Campus Martius), as well as to the Amtrak and SEMCOG commuter rail hub at New Center, the route’s northern terminus. With a route that simply travels down one street, from one rail transit system to another, the M-1 Rail is truly the last mile that completes a regional rail network.

Transit-System Hubs
Transit hubs, where multiple transit systems and technologies connect, have proven themselves as valuable development opportunities since the creation of the Cleveland Union Terminal, now known as the Tower City Complex. Tower City sits atop an underground RTA station that connects the Red, Blue, Green, and Waterfront lines – as well as the Healthline BRT just outside the front doors – in addition to all of RTA’s local buses that hub in and out of the surrounding Public Square. As such, Cleveland resembles the most comprehensive transit hub – a historical legacy of what was once the nation’s fifth largest city. That said – as a historic legacy asset, Tower City is built-
out – as are some of the city’s tertiary transit hubs, including Shaker Square where the Blue and Green light rail lines split off from each other. In Cleveland, the potential prospect of a lakefront transit hub for the Waterfront Line, city buses, and Amtrak offers new TOD potential.

Philadelphia best exemplifies modern-day TOD at a transit system hub, with its 30th Street Station District. This district, carved out of residual land surrounding the station, inaccessible land along the Schuylkill River, and even capping the switching tracks, is also the clear focus of TOD in Philadelphia. While there are two TRID projects, one in West Philadelphia and another in North Philadelphia, neither approach the scale and magnitude of the 30th Street Station District. Designed and planned by SOM, Parsons Brinckerhoff, OLIN, and HR&A Advisors – this project also features public sector involvement from Amtrak, PennDOT, SEPTA, NJ Transit, City of Philadelphia – as well as both University of Pennsylvania and Drexel University. Drexel will in fact be a major tenant and financial participant to the 88-acre, 18 million sq.ft. project. The completion of this project will give Philadelphia a true mixed-use hub. Amtrak has stated plans to extend this concept to Chicago, Washington, Baltimore, and New York City.
Historic Synergies
While there are some newer cities among these case studies, there are also some with a rich legacy of streetcar transit. Cleveland, Cincinnati, and Kansas City in particular resemble the type of urban fabric created by early 20\textsuperscript{th} Century electric streetcars. The strength of these cities is the leftover corridors of dense urban fabric originally built to support transit in the first place.

Cleveland and Cincinnati both had over 30 historic streetcar lines, which in the case of Cincinnati, are entirely extinct now. That said, and despite a lack of local and regional involvement in promoting TOD in Cincinnati, their streetcar will benefit from the rich historic fabric through which it will traverse. In particular, Over-the-Rhine is the nation’s largest historic district, based off of number of contributing properties. This vast historic landscape, nestled between the Ohio River and rugged hills, has seen a resurgence that has already netted significant revitalization. 3CDC, or the Cincinnati Center City Development Corporation, alone has invested over $1.2 billion into Over-the-Rhine; for them, the streetcar represents another major asset for development. 3CDC has been the most public leader behind this important historic district’s transformation, and as stewards of this neighborhood and its continued mixed-income growth, will absorb the streetcar into its success story.
Affordable Housing

As Pollock, Bluestone, and Billingham 2010 proved, there is an undeniable nexus between rail transit and gentrification – particularly in strong market cities. Their study also interestingly showed that car ownership rates increased after the addition of rail transit, even in weak market cities, as a function of “gentrification.” Due to this link, and a broader perception of gentrification around rail transit, many communities seek to make affordable housing a TOD priority.

The Twin Cities are the undisputed model for affordable housing TOD policy and implementation. All TOD policies (state, regional, and local) do not just require an affordable set-aside as in many cities, but solely support affordable projects. As the 2012-completed Green Line in St. Paul has since spurred well over $4 billion of development, stakeholders in the area have gone further to establish substantial institutional capacity dedicated to affordable housing development along the Green Line. This includes the creation of the Central Corridor Funders Collaborative, which furthers low-income community organizing, offers planning support for affordable housing, and itself plans to invest $20 million into the corridor. The Blue Line, which runs through Minneapolis, has similarly been a major focus of affordable housing TOD. The Twin Cities are not mitigating the gentrification effects of light rail as much as they are proactively leveraging the light rail into a major boost for affordable housing that is sorely needed in such a strong market metro.
Air Rights
There is no greater form of TOD orientation, marking the difference between transit-oriented and transit-adjacent development, than air rights construction, which does not just include spatial and planning benefits, but also brings agencies and developers together on developing projects. Washington, DC’s Metrorail is the standard bearer for air rights construction, although historically Chicago is better known for this method where it is more frequently used to cap freight railroads. WMATA’s Metrorail is very unique for its comprehensively-designed station transitscapes. In a way, it is almost an experiential transitscape – as riders catch trains in the iconic vaulted subway stations, and emerge past the escalators in the middle of an extended transitscape. This extended transitscape often includes either office buildings, as in the case of Farragut Square pictured, or retail power centers as in the case of Columbia Heights pictured. At Columbia Heights, where a struggling neighborhood previously lacked a Metrorail connection, Metrorail riders now emerge in the midst of an open-air shopping mall that supports and employs a diverse, mixed-income neighborhood.

Statewide Programs
Last but certainly not least among innovative development tools is Commonwealth of Pennsylvania’s Transit Revitalization Investment Districts program. Created at the state level, the program functionally supports development around mass transit assets in Pittsburgh and Philadelphia and their surrounding regions. As diverse as these
regions are – replete with cosmopolitan urban cores, the struggling urban flip-side, affluent suburban hamlets, and post-industrial Rust Belt towns – TRID is unique for its flexibility, in offering something different for many of its stakeholders.

In the case of Pittsburgh, which is legally maxed-out on its allowable TIF capacity (capped at 10% by Commonwealth law), TRID offers an alternative value capture mechanism that can incentivize development. In the case of Bryn Mawr, on Philadelphia’s Main Line, and other affluent suburbs – TRID offers a way around the Commonwealth law’s requirement for a blight declaration before TIF can proceed. Without any way to reasonably declare a sight blighted or distressed, these communities cannot plan any redevelopment until it does become blighted or distressed. Meanwhile, the Commonwealth also has many smaller towns that are struggling to cope with the loss of industrial jobs, including Marcus Hook on the Delaware River – which through TRID has received minimal yet meaningful state support through planning grants, that increase their planning capacity to potentially take advantage of the passenger trains that few people board at Marcus Hook.

It is worth noting that TRID has not exclusively yielded TOD, in part due to the newness of the program and the market recession shortly after its passage in 2004, but also due to the wide spectrum of communities to which it applies. Smaller communities in particular move slower when it comes to implementing complex TODs. Furthermore, Austin and Fogarty 2011 discusses that there has yet to be a TOD in the Commonwealth that has utilized TRID fully. Since the 2011 study, only the East
Liberty Transit Center (featured as a case study) has fully utilized TRID’s value capture mechanism to fund infrastructure improvements. Since the program’s creation in 2004, 13 projects have utilized TRID planning grants.

**Key Implementation Opportunities**

All of these innovations within the TOD tool kit have been studied for this thesis for their potential applicability elsewhere. One of the unifying strands that ties together these development tools is that they all require extensive leveraging – whether that be leveraging of local matching funds (which in the case of Detroit, came from the non-profit sector), whether that be through planning processes, and especially through public-private partnerships. In many cases, these mechanisms, especially TRID, first require a developer to create value which can be leveraged to pay off infrastructure bonds for the transit that in turn makes development more valuable. This is a virtuous cycle that truly resembles the collaborative process of city-building as it has been practiced since Rome – in which people are drawn to the city by its leveraging opportunities.

There are some things that fixed-guideway transit projects absolutely require in order to be successful, and there are some things that are added perks. Regional planning and multi-modal connections are not negotiable if a transit system is intended to actually provide transit service. Especially due to the limited scale of many of these starter streetcars – the most effective means that these “first phase” systems have to extend their reach before extensions can be funded and built is through meaningful
multi-modal and regional connections. Toward the goal of expanding a transit system to the regional scale, planning at the regional level is required. Every comprehensive metropolitan transit network, such as DART or Twin Cities METRO, came about through a regional planning process through which a regional funding mechanism was adopted.

While not absolutely essential for a basic level of success, a central transit hub often represents a pinnacle development opportunity. Having such a hub not only makes the multi-modal and regional connections more effective, but also offers those connections as well to TOD, and creates a central marketplace for TOD as well as for transportation. In the case of Cleveland, the Cleveland Union Terminal / Tower City Complex represents the largest development ever built in the entire state. Similarly, Philadelphia’s 30th Street Station District is set to dramatically transform both West Philadelphia and Center City, which will be connected through this 88-acre labyrinth of new glass and steel high-rises.

Affordable housing is similarly not essential for a basic level of success, but it also resembles a major opportunity for both development and long-term strategic partnerships. Minimally, there are ethical implications to not even mitigating gentrification effects of transit corridors. The best long-term strategic partnership toward this goal is resembled by support from the Twin Cities non-profit sector and Minnesota Housing. There is no reason why housing finance agencies in other transit-bearing states also should not prioritize transit areas and forge long-term partnerships with transit agencies and TOD developers. Doing so realizes beneficial efficiencies by
combining housing and transportation affordability strategies that will substantially increase the quality of life for low-income residents.

States can also develop programs similar to TRID – which provides a basis for holistic TOD planning that which can be expanded to entice additional transit investment. In Ohio in particular, the state with the most Census-designated metropolitan areas, the primary problem in applying for federal grants (TIGER, New Starts, Small Starts, etc) has been the inability to produce a local match from cash-strapped cities. A program like TRID can be expanded to include more concrete state support, in the way of infrastructure dollars requiring a federal match, that would encourage cities to be more proactive in applying for federal grants – and planning to do so. To take TRID to another level, state-level planning programs should offer funding for planning processes that specifically meet federal funding requirements. In order to meet the legal requirements of a local funding match, such state support should be structured as a local partnership, perhaps even as pass-through funds that go through the municipalities.

Transit That Goes Somewhere
This study has focused on how a diverse list of cities have utilized a diverse range of transit typologies to achieve a diverse set of goals. The commonality across the board is the pursuit of leveraging opportunities and the facilitation of public-private partnerships that are required to implement such complex, yet beneficial, projects. Perhaps an understated commonality is also the extent to which these cities employ
tools of innovation to overcome financing obstacles, whether in terms of federal funding matches, or finding first-in dollars for small-area infrastructure improvements, or even just closing a financing gap for a privately-developed TOD. All of these things require partnership that is held together by the promise of developing along transit.

In the end, cities that implement transit projects – going a step further than most cities already – will not just succeed on the face of the transit project itself, but also open the door to a virtuous cycle that can catalyze community change. In addition to the traditional benefits of transit in terms of getting people to work, connecting residents to community amenities, and providing invaluable access to those without a vehicle – developing around transit cements these virtues into the visible fabric that comprises a city. As such, TOD creates place; it creates equity; and it creates growth. Furthermore, it does all three of these things regardless of market strength in a metropolitan area.
Chapter 5: Policy Tool Kit for TOD Strategy

Strategies and best practices that rise to the forefront of the case study cities will be outlined in this section. This will be done through describing the strategies, which cities exemplify a particular strategy, and what aspects of that city’s context relate to that strategy. In addition to these descriptions, charts will be provided to organize the information. All of this is intended to provide a resource to development and policy practitioners who may be pursuing sustainable development goals through transit-oriented development. Indeed, while not all case studies will apply to any community, some of these will be particularly helpful to communities that match the context of a case study.

Context is Everything
The strength of Transit-Oriented Development is derived from its context. Oftentimes, that urban context, which is the surrounding urban fabric that transit connects, is made better by the access provided by mass transit infrastructure; however it may still not meet its full potential until TOD truly bridges the physical gap.

As it relates to the case studies within this thesis, and the lessons derived from them, context is thematic; it relates to the challenges that these cities are seeking to solve through implementation of TOD, and the innovations they have pursued toward those
ends. In some cases, the challenge is housing affordability (Minneapolis, DC), whereas in other cases the challenge is a weak real estate market (Cleveland, Cincinnati, Detroit, Pittsburgh, Philadelphia). On a different issue, in some cities the challenge is transporting high ridership as efficiently as possible (DC, Philadelphia), whereas in other cities the challenge is either encouraging transit as a means of alleviating traffic congestion (DC, Dallas) or as a means of developing density in the urban core (Oklahoma City, Kansas City, Detroit). That said, all of these cities are united in the goal of promoting sustainable development, which exists as unifying context for all of these case studies.

As it relates to the differing goals of TOD strategies, the following chart matches programmatic strategies to the goals that they accomplish. While all cities are unified in their goal of promoting sustainable development, some of these TOD strategies are critical to achieving a basic level of success toward that goal.
<table>
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<th>Goals</th>
<th>Strategy</th>
<th>Dallas-Deep Ellum</th>
<th>Oklahoma City</th>
<th>Kansas City</th>
<th>Minneapolis-St Paul</th>
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Table 22 Road map for matching goals and strategies to specific case studies.
Eight Strategies for TOD:

Regional Scale Planning
- Expanded revenue catchment
- Enhanced planning process
- Benefit from increasing stakeholder diversity

Affordable Housing
- Combat gentrification effects
- Affordability efficiencies by combining housing + transportation
- Unique market opportunities including cross-subsidy

Multi-Modal Connectivity
- Expand transit service scope by syncing with existing modes
- Complement existing system
- Encourage ridership from long-term transit users

System Hub
- Concentrated activity in one place
- Anchor opportunity for urban core
- Opportunity to develop a TOD exemplar

TOD Incentive Programs
- Opportunity to incentivize policy goals such as affordability or reduced parking
- Opportunity to systemically lead market toward TOD sites

Air Rights
- Seamless vertical integration between transit and development
- Transit placemaking opportunities
- Transit prominently featured in design

Historic Synergies
- Restoring former streetcar corridors
- Areas often have retained transit-supportive urban fabric
- Synergies with other development initiatives including historic tax credits

Statewide Program
- Opportunity to support multiple urban cores in a state (TRID: Pittsburgh and Philadelphia)
- Opportunity to help cities with matching funds needed for federal grants
- Integration with other state policies on transit/transportation

Figure 19 Visual representation of benefits of each of eight strategies
It is going to be difficult to develop a high-functioning transit network without regional-scale planning, TOD incentive programs, and multi-modal connectivity. Regional-scale planning will be crucial toward leveraging funding to build a system, whereas multi-modal connectivity is essential toward serving riders from communities not directly served by fixed guideway transit, and lastly a TOD incentive program is essential toward encouraging the private market to take advantage of transit-oriented sites.

Another three strategies fall within the realm of realizing efficiencies within the context that transit may serve. Particularly, synergies may be realized through leveraging common goods such as affordable housing, urban design configurations (particularly air rights), and historic corridors. While not completely essential toward achieving a basic level of success, these are the factors that will make a transit system particularly successful with TOD.

As it relates to historic synergies, Cincinnati is an emergent case study. That city’s streetcar has come without a significant TOD program, but will realize valuable synergies with the historic fabric in Downtown Cincinnati and particularly the Over-the-Rhine neighborhood, which is one of the nation’s largest National Register historic districts. Furthermore, many cities will find that their best new streetcar routes are simply those from yesteryear. An example of this is Cleveland’s Blue and Green light rail lines, on which GCRTA runs modern-era light rail rolling stock on the same historic right-of-way that originally established Shaker Heights as a streetcar suburb.
Another example of this is Main Street in Kansas City, where the new streetcar routes connects three significant historic districts (the River Market, Downtown Kansas City, and the Crossroads).

Leveraging transit corridors for the production of affordable housing is a particularly vital opportunity for cities to pursue. While the market has a capacity of market-rate housing that can be supported, few cities provide near enough affordable units to meet the need that exists within their market. Promoting affordable development along transit corridors is strategic for the following key reasons:

- Affordable unit production does not compete with market-rate development
- An under-served market segment, it stands as a major development opportunity
- Affordable residents will benefit from combined housing and transportation savings
- New transit corridors may encourage gentrification and displacement
- TOD partnerships offer the potential for organizational capacity-building

The last strategy within the realm of synergistic efficiencies is leveraging urban design synergies, and particularly that of air rights construction. Air rights, usually structured through a long-term land lease to build development above a transit station, offer the highest form of integration between the transit and the development. In some cases, this is the different between true transit-oriented development and transit-adjacent development, which is a duality only distinguished by TOD agencies that have utilized air rights. Washington, DC is by far the best example of air rights TOD, which also
includes the Orange Line into Arlington, VA – perhaps the nation’s best localized example of value add vis-a-vis air rights TOD. The Washington Metro is unique for having mostly underground transit stations, but also still vigorously pursuing TOD throughout the system. It is more common for cities with grade-separated passenger rail systems to selectively develop TOD.

The pinnacle of TOD strategies are those that create a virtuous cycle in funding the infrastructure that is necessary for TOD in the first place. TIF, or tax increment financing, is commonly used as a means of capturing the value of TOD to pay back bonds used for transit construction, however its implementation is remarkably localized and uneven. TIF is often a contentious issue in many communities, and the most common comprehensive TIF strategies that cities will adopt are limiting strategies, rather than strategies to maximize the public benefit of TIF.

The Commonwealth of Pennsylvania is very unique for the implementation of a statewide program for TOD, which is the Transit Revitalization Improvement Districts program. This program offers planning support from the state, as well as a public process framework. It also allows transit agencies to form partnerships to develop excess land, and most importantly allows for a value-capture mechanism similar to TIF. This is particularly valuable within the context of Pennsylvania, where cities are capped on their TIF capacity, and must first issue a blight declaration.
A common problem with promoting sustainable development through TOD and transit, across all of these case studies and indeed into many surrounding states, is the scarcity of resources available for transit infrastructure. Also, per the FAST Act, the rising local match requirement for TIGER grants will increase barriers for more cities to implement fixed-guideway transit systems. This has caused paralysis in transit planning: many cities have formally studied transit corridors that they cannot afford to implement, many cities are reducing the scope of transit corridors that they can implement, and many cities are reducing transit amenities and physical footprint ("BRT-lite" systems) beneath the approximate threshold for a fixed-guideway corridor to catalyze TOD.

These issues of transit planning paralysis all feed back into the common funding problem – which is one of securing a TIGER grant, and then finding supplemental funding for a local match. In the case of Detroit, this problem was solved through philanthropic support, which came from a variety of entities, namely large foundations that were already doing work to improve quality of life in Detroit’s neighborhoods. A philanthropic match would not have counted as a local match were it not for Congressional action that changed the standards for what could count as a local match. These new standards do not just apply to Detroit, but could be a potential boon for all cities considering public-private partnerships for TOD. In the case of Detroit’s public-private partnership, the philanthropic support was largely naming rights sponsorships (every transit station is always a naming rights opportunity) that were structured in the
form of an up-front capital contribution. While innovative as a transaction, these partnerships built off of well-established precedents regarding public-private partnerships for TOD.

Combining the infrastructure driver strategies employed in Pennsylvania and in Detroit could potentially solve the issue of funding transit infrastructure, even within today’s context of scarce infrastructure resources. The strength of Pennsylvania’s TRID program is its statewide context, in that it offers something for vastly different communities around both Pittsburgh and Philadelphia. Other large states that struggle with equitably dividing resources between multiple cities could benefit from a similar framework. For instance, a TRID-like program in Ohio could potentially offer a tremendous amount of TOD support and even infrastructure funding to major metropolitan areas with fixed-guideway transit like Cleveland and Cincinnati, and could provide a major impetus for implementation in others without such as Columbus, Dayton, Akron, and Toledo. A program that could further sustainable development goals across six (6) major metropolitan areas would make a substantial difference at the national scale. As indicated by the inventory of TOD programs, the statewide level has also been the most difficult source of support – only three states have accomplished TOD programs at the state, regional, and local scales. Bringing state policy-makers to the table is an essential first step toward comprehensive support and planning for transit and its related sustainable development.
TOD does not happen by accident. In fact, this study provides noteworthy examples of cities that have defied their traditional context in order to effect the wide-scale implementation of TOD. For cities such as Dallas and Oklahoma City, motivated by the goal of concentrating density toward a development driver, the addition of rail-based transit infrastructure has changed everything. For other cities such as Cleveland, Detroit, and Philadelphia – motivated by a common goal of revitalizing inner-city neighborhoods with renewed development interest – the addition of fixed-guideway transit infrastructure has also changed everything, with the notable inclusion of Cleveland’s Healthline BRT. All of these cities have pursued fixed-guideway transit commensurate with the level of TOD success they have experienced; the cities that experience a greater degree of TOD are those that plan for it.
For a region such as the Twin Cities, success is not defined by driving sheer development numbers, which they have done with over $5 billion of TOD along the Green Line alone; but rather, the stakeholders in those communities have defined success by the extent to which they can leverage light rail for holistic and equitable community development. This means a route that opens up economic opportunities for low-income and moderate-income communities, prioritizing the production of affordable housing along light rail sites, and preempting the possibility of displacement as a result of gentrification processes. Toward this goal, the Twin Cities have used tools such as community land trusts, and even creating non-profit organizational capacity dedicated to the production of affordable housing TOD. All of these cities have targeted TIF capacity, or a different value capture mechanism in the case of Philadelphia and Pittsburgh, toward TOD sites. It so happens that among these case studies, the Twin Cities, Philadelphia, Pittsburgh, and Washington, DC are the only cities that structurally provide for affordable housing within their TOD incentive programs. It also happens that these are the cities that are catalyzing the largest sheer volume of TOD, by maximizing both affordable and market-rate development opportunities simultaneously.

The transformative role of transit and specifically TOD is best exemplified by the Detroit case study, where the M-1 Rail project has attracted over a billion dollars of TOD to the Woodward Avenue corridor. As Downtown Detroit exists as a well-established pocket of stability, the M-1 Rail is now ventilating this stability northward
through Midtown and New Center – effectively stabilizing Detroit’s inner core neighborhoods. The impact of this stabilization on a city that has recently emerged from the nation’s largest municipal bankruptcy cannot be understated – this is also a dual effect, as the bankruptcy process has positioned Detroit for broader growth, and made it more attractive for redevelopment in the coming years. The M-1 Rail stands as a particularly unique case study, where a transit system was implemented with significant support from the non-profit community.

For cities with already-dense neighborhood fabric, and strong corridors once-served by rail transit, implementing development-oriented transit is an ideal strategy for promoting sustainable development goals. For cities that lack the levels of density needed to support high-quality transit service, it will also be especially important to formulate TOD policies that grow ridership in the years to come. The implementation of TOD can be pursued in a variety of different ways, outlined in this study. All of these strategies relate differently to the context in which a city may find itself – dispelling the notion that TOD is a one-size-fits-all strategy – and more importantly empowering cities that do not conform to the ideal transit-propensity levels needed to support transit at its inception. If a city earnestly pursued TOD, plans for it, and allocates resources to its implementation – TOD is within reach for most large cities.
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Appendix A: Glossary of Terms
Best Management Practices (BMP): Techniques and practices found to be the most effective means of achieving an objective.

Public-Private Partnerships (PPP/3P/P3): A partnership funded and executed by a partnership of government and one or more private sector entities for the purpose of delivering a service.

Design-Bid-Build (DBB): A PPP model in which the public sector contracts with separate entities for the design and construction of a project.

Design-Build (DB): As it relates to PPP, the public sector contracts with a single entity for the design and construction of a project.

Design-Build-Finance-Operate (DBFO): A PPP model in which the public sector contracts out the design and construction services required to deliver a project, while also transferring operation of a facility over to the same entity for a contracted period of time.

Build-Own-Operate (BOO): A PPP model in which the private sector designs, builds, and operates a facility with some degree of assistance from the public sector.

Alternatives Analysis (AA): A study required as part of FTA’s funding process, in which all potential route and technology alternatives are analyzed.

TIGER: Transportation Investment Generating Economic Recovery, which is a transit-funding grant program of the Federal Transit Administration.

New Starts / Small Starts: New Starts is an FTA capital grant program funding projects with total costs exceeding $250 million, whereas Small Starts is an FTA capital grant program funding projects with costs less than $250 million.
**Direct Fees:** User and utility fees, including transit fares, as well as congestion pricing.

**Debt Tools:** Private debt, bond financing, and state infrastructure tools.

**Credit Assistance:** Financing obtained through the Transit Infrastructure Finance and Innovation Act (TIFIA).

**Equity Sources:** Funding from public-private partnerships and available infrastructure investment funds.

**Value Capture:** Developer fees, exactions, special taxing districts, tax increment financing (TIF), and joint economic development partnerships.

**Tax Increment Financing (TIF):** Ad valorem value is captured within a district and reinvested toward infrastructure improvements.

**Redfields:** Property with unknown or uninvestigated contaminant conditions.

**Brownfields:** Property with known contaminant conditions.

**Greenfields:** Undeveloped property, often at the edge of an urbanized area.

**Land Banks:** A governmental entity established to acquire and repurpose vacant and abandoned property.

**Vintage Streetcar:** Historic streetcar rolling stock, often implemented for the express purposes of conjuring a sense of heritage.

**Modern Streetcar:** Modern streetcar rolling that is similar to modern trams in Europe, Asia, and Latin America.

**Heavy Rail / Rapid Transit:** Heavy rail and rapid transit are synonymous, characterized by high speed, fixed platforms, and dedicated right-of-way.
**Light Rail**: Lower capacity fixed rails that operate on electricity drawn from an overhead line.

**Commuter Rail**: A type of passenger rail system that is primarily operated during heavy commuting hours.

**Bus Rapid Transit**: A type of bus system alignment with upgraded rolling stock and stations, often with signal priority and dedicated right-of-way.

**Affordable Housing**: Subsidized housing set-aside for income-qualifying tenants.

**Gentrification**: A process of neighborhood-upgrading that involves displacement of existing residents due to rising housing costs.
Appendix B: TOD Photo Galleries
Figure 21 Columbia Heights Station Plaza, with prominent placemaking features, including public art and a concert stage
Figure 22 Linwood Avenue looking at retail development west of Columbia Heights station
Figure 23 Linwood Avenue looking at mixed-income residential infill between 14th (TOD area) and 16th
Figure 24 Evening Concert at Columbia Heights metro station plaza
Figure 25 Historic core on 14th Street in Columbia Heights, including the Tivoli Theater and several other performance art anchors
Chinatown / Gallery Place TOD

Figure 26 Inside Metro station beneath Gallery Place
Figure 27 Placemaking above Gallery Plaza station (entrance inside rotunda), including famed Chinatown Arch.
Farragut Square TOD:

Figure 28 Typical air rights development above Farragut North Metro station escalators
Figure 29 One of two Capital Bikeshare stations at

Farragut Square
Figure 30 Placemaking including projected NCAA tournament basketball game on blank building wall
Figure 31 Capital Bikeshare station across U Street from Metro station
Figure 32 The Ellington development located across from U Street Metro station
Figure 33 Metro station escalators located to the left of Starbucks, with mid-block transit plaza set-back
Figure 34 Wal-Mart (LEED adaptive reuse project) located a block north of Union Station on H Street
Figure 35 Bike cycle track in front of Union Station
Figure 36 Retail concourse inside Union Station
Figure 37 New apartment community located behind Union Station rail yard
Figure 38 Terminus of the Streetcar on H Street in the middle of the railroad overpass. No direct bridge or connection into Union Station.
Convention Center TOD

Figure 39 Metro station rotunda pictured at left, convention exhibition hall beneath streets (notice concrete pavers), convention center amenity rooms above street, and existing affordable housing pictured at right
Figure 40 Block of affordable housing above underground convention exhibition floor
Philadelphia Photo Gallery

Market and Broad Street:

Figure 41 New subway ramps are a focal point of Center City District's renovation of Dilworth Park in front of Philadelphia City Hall
Figure 42 Dilworth Park transitscape
30\textsuperscript{th} Street Station:

Figure 43 30th Street Station viewed from across the Schuylkill River
Figure 44 View of 30th Street Station District high-rises under development
Figure 45 Newly-installed placemaking elements along Market Street in front of 30th Street Station
Victory Park:

Figure 46 Victory Park approach to American Airlines Center
Figure 47 W Hotel and Victory Park retail buildings
Figure 48 Victory Station behind the Victory Park development
Figure 49 Pedestrians must cross 8 lanes of traffic on Harry Hines Blvd when walking from the Victory DART Station to the W Hotel at its centerpiece
North Green Line:

Figure 50 Green Line at Mockingbird Lane
Figure 51 DART light rail train heads southbound past Mockingbird Lane
Figure 52 Dallas Love Field Airport and Southwest Airlines HQ have a station, but no feasible pedestrian access
Figure 53 Passengers wait at Mockingbird Lane
Figure 54 Newer DART Station in Farmers Branch
Figure 55 Miles of warehouses and industrial sites that predate the DART Green Line
Figure 56 DART Station and apartment TOD in Farmers Branch
Figure 57 DART Green Line passes Downtown Carrollton on an elevated alignment
Figure 58 Elevated DART station at Downtown Carrollton, with apartment TOD on the right
Figure 59 Trinity Mills Station in Carrollton - transfer point between DART and DCTA A-Train to Denton
North Red Line:

Figure 60 TOD at Park Lane Station, across from North Park Mall (flagship Neiman Marcus)
Figure 61 Interior of Mockingbird Station development
Figure 62 Historic Western Union warehouse, integrated into Mockingbird Station as 200 loft apartments and street retail
Figure 63 Below-grade DART Red Line station at Mockingbird Lane
Figure 64 DART train departing Mockingbird Station
Figure 65 Angelika Cinema directly adjacent to DART station
Figure 66 Retail and office space in the heart of Mockingbird Station
McKinney Avenue Streetcar:

Figure 67 McKinney Avenue Streetcar wraps through the West Village development near City Place
Figure 68 New development along McKinney Avenue Streetcar
Pacific Avenue Transit Mall:

Figure 69 All DART light rail lines converge through downtown on Pacific Avenue
Figure 70 Oaks Station Place at E. 46th and Hiawatha
Figure 71 More residential TOD across Hiawatha, on formerly industrial railroad-adjacent land

Figure 72 Lake Street Station affordable housing development, and Blue Line station
Figure 73 Riders boarding a Blue Line train at Lake Street
Figure 74 One of two stations at Minneapolis-St. Paul International Airport
Figure 75 Older apartment building on the Hiawatha Corridor near Fort Snelling
Green Line (Central Corridor):

Figure 76 Prairie School-styled transit pavilion at the University of Minnesota East Bank station

Figure 77 Green Line meanders through student housing complexes on former brownfield sites east of campus
Figure 78 Grain mills surround Blue Line station at Prospect Park. Platform stations have push-button heaters.
Figure 79 Platform at Westgate Station

Figure 80 Vietnamese businesses in St. Paul's Little Mekong district
Figure 81 Typical Blue Line station. Stations incorporate public art, ticket kiosks, push-button heaters, next-arrival informatics, among other amenities.
Figure 82 All Blue Line stations are center-alignment platforms
Figure 83 Blue Line Station at Midway, with Episcopal Homes of MN's affordable senior complex adjacent
Figure 84 Pedestrian ramps connect station platforms to cross-walks
Figure 85 Community center at Dale Street in St. Paul's Little Mekong district
Figure 86 The Spruce Tree Building, a mid-century icon at University and Hamline in western St. Paul
Nicollet Mall (downtown transit mall):

Figure 87 Nicollet Mall station with new upscale TOD adjacent
Figure 88 The Nic, a recently-opened condo tower, anchors the Nicollet Mall Station
Figure 89 Site of new Wells Fargo HQ adjacent to Downtown East station
Figure 90 Typical downtown station with expanded platforms and LED displays
Figure 91 Downtown East station platform in front of new NFL stadium
Figure 92 Healthline beginning its route in front of the Tower City intermodal hub
Figure 93 Euclid Commons student housing development across the street from Cleve. St. Univ.
Figure 94 Cleveland State University College of Nursing on the Healthline
Figure 95 Transit placemaking at the Playhouse Square Healthline station
Figure 96 Transit placemaking at Playhouse Square station and the IDEA Center
Figure 97 Healthline station in University Circle, where it switches to curb-side alignment in mixed traffic
Figure 98 Uptown development in University Circle
Figure 99 Healthline bus stops at a curbside station in University Circle
Figure 100 Healthline corridor through Midtown Cleveland, which is branded as the Health Tech Corridor
Figure 101 Healthline looking across the I-90 Innerbelt toward Downtown Cleveland
Figure 102 Multiple Healthline buses caught behind each other, a result of non-optimal signal prioritization
Red Line:

Figure 103 Typical winter conditions of Euclid Avenue underpass connecting Healthline to Red Line
Figure 104 RTA rail hub beneath Tower City complex
Figure 105 Platform at Triskett Station on the far west side of Cleveland
Figure 106 W. 25th Street station, designed to emulate the West Side Market across the street.

Figure 107 Red Line entering downtown Cleveland on the viaduct over the Cuyahoga River.
Figure 108 Red Line train stopped to board at Cedar-University station

Figure 109 Red Line train stopped for boarding at W. 117 and Madison
Blue, Green, and Waterfront Lines:

Figure 110 Warehouse District Station on the Waterfront Line
Figure 111 Settler's Landing station on the Waterfront Line, in the Flats

Figure 112 Blue Line station at Van Aken Boulevard and Lee Road in Shaker Heights
Figure 113 New condo development on the Blue Line along Van Aken Blvd in Shaker Heights
Figure 114 The Blue Line's higher ridership, of the LRT lines, is due to historic mid-rise housing stock that lines Van Aken Blvd.
Figure 115 Streetcar route begins at the City Market, the U.S.' oldest continuously-operating public market
Figure 116 Kansas City skyline towering over the market stalls at the City Market
Figure 117 A streetcar stop in the City Market neighborhood, where streetcar operates in mixed-traffic with back-in angled parking
Figure 118 Streetcar entering the Power + Light District on the south side of downtown
Figure 119 Historic Main Street Theater restored as a flagship AMC Theater (headquartered nearby)
Figure 120 Streetcar stop in the Power + Light District
Figure 121 Streetcar tracks running through the Crossroads District south of downtown
Figure 122 Kansas City's Union Station, the southern terminus for the streetcar
Figure 123 New streetcar tracks on Race Street in front of Washington Park and the Cincinnati Music Hall
Figure 124 New streetcar tracks at 12th and Vine in Over-the-Rhine
Figure 125 Turning tracks at 12th and Race in Over-the-Rhine
Figure 126 Streetcar stop at 12th and Vine in the heart of Over-the-Rhine
Figure 127 Italianate-style block adjacent to Findlay Market, currently under redevelopment
Figure 128 Vine Street, Over-the-Rhine's main street, a block north of the streetcar stop
Detroit Photo Gallery

M-1 Rail:

Figure 129 M-1 Rail in front of the new Red Wings Arena
Figure 130 M-1 Rail and some 2000s-era townhome infill across Woodward Avenue from Red Wings Arena site
Figure 131 M-1 Rail and related TOD (historic rehab) in southern Midtown
Figure 132 M-1 Rail and related TOD (new construction on left) in southern Midtown
Figure 133 M-1 Rail at Mack & Woodward avenues, in front of Midtown Whole Foods
Figure 134 M-1 Rail wrapping around the Campus Martius park in Downtown
Figure 135 M-1 Rail at Woodward Ave and Clifford Street in Downtown
Figure 136 M-1 Rail in Downtown