

2015

# Feasibility Analysis and Strategic Measures for Promoting Viable New Urban Development

Elizabeth J. Farr

*Claremont McKenna College*

---

## Recommended Citation

Farr, Elizabeth J., "Feasibility Analysis and Strategic Measures for Promoting Viable New Urban Development" (2015). *CMC Senior Theses*. Paper 1210.

[http://scholarship.claremont.edu/cmc\\_theses/1210](http://scholarship.claremont.edu/cmc_theses/1210)

This Open Access Senior Thesis is brought to you by Scholarship@Claremont. It has been accepted for inclusion in this collection by an authorized administrator. For more information, please contact [scholarship@cuc.claremont.edu](mailto:scholarship@cuc.claremont.edu).

CLAREMONT MCKENNA COLLEGE

**Feasibility Analysis and Strategic Measures for Promoting Viable New Urban  
Development**

SUBMITTED TO

Professor William Ascher

AND

DEAN NICHOLAS WARNER

BY

Elizabeth Farr

for SENIOR THESIS

Fall 2014/Spring 2015

April 27, 2015



## Table of Contents

Acknowledgements.....	iv
Abstract.....	v
<b>Chapter 1 Damaging Effects of Greenhouse Gas Emissions and Climate Change....</b>	<b>1</b>
1.1 Human Health Impacts.....	2
1.2 Ecological Impacts.....	3
1.3 Economic Impacts.....	4
<b>Chapter 2 Background Trends and Policy Solutions.....</b>	<b>7</b>
2.1 Climate Change Trends.....	7
2.2 Technology Trends.....	8
2.3 Governmental Efforts.....	13
2.4 Corporate Social Responsibility and Individual Action.....	19
2.5 Sustainable Development.....	21
<b>Chapter 3 Economic and Political Viability of New Urbanism.....</b>	<b>34</b>
3.1 Case Studies.....	34
3.2 Economic Viability.....	41
<b>Chapter 4 New Urbanism Perspectives and Contexts.....</b>	<b>65</b>
4.1 Urban Planning Perspectives.....	65
4.2 Restricting Contextual Factors.....	69
4.3 Enabling Contextual Factors.....	77
<b>Chapter 5 Measures to Enable New Urbanism.....</b>	<b>84</b>
5.1 Changes of Rules and Regulations.....	84
5.2 Enactment Strategy.....	93
<b>Chapter 6 Conclusion.....</b>	<b>100</b>
References.....	102

### **Acknowledgements**

I would like to thank Professor William Ascher for challenging and mentoring me throughout my thesis process and senior year. Bill's guidance helped me to consider problems in a holistic, critical, and intelligent way that I will carry with me moving forward. I would like to thank Marin Coffee Roasters for keeping me motivated and inspired during the summer when I was the only one already working on thesis. I would also like to thank **Chase Pribble** for helping me stay calm and humoring me by walking to the village rather than driving, and Melanie Paty for completing this final stretch of our EEP adventure at CMC together.

## **Abstract**

This thesis demonstrates that New Urbanism is both an advisable and feasible method for reducing carbon emissions to mitigate global climate change. New Urban areas commonly generate lower carbon emissions compared to conventional suburban development due to lower car use and higher levels of walking and use of other forms of transportation. Economic and political feasibility of New Urban development is determined by analyzing case studies, housing price premia, financing, and fiscal impact. The many contexts and perspectives involved in the planning process are analyzed to determine if New Urbanism is advisable in the larger setting in which developers, advocates, and governments operate. In order to enable the planning strategy to achieve a more positive effect and become more widespread, key policy changes and strategic enactment measures are delineated. This thesis finds that New Urbanism has very strong potential to have a significant positive impact on urban sustainability.

## **Chapter 1 Damaging Effects of Greenhouse Gas Emissions and Climate Change**

Climate change is a rapidly occurring phenomenon with damaging effects that will extend long after humans take significant action to minimize the problem. It has been identified by many as one of the most significant problems facing the world today. Since the 1950s, the climate system has seen changes unprecedented for decades or even millennia, including changes in extreme weather events and an increase in warm days and nights. Scientists report significant ocean warming and more heavy precipitation events on average than trends of the past. Greenland and Antarctic ice sheets are losing mass and glaciers have shrunk worldwide. The rate of sea level rise since the mid 19<sup>th</sup> century has been larger than the mean rate during the two previous millennia (IPCC 2013, 4, 7, 11). However, taking action to reduce major sources of climate change entails economic costs that can undermine the prosperity and well being of many populations.

The changing climate is caused by increased atmospheric concentrations of the greenhouse gases (GHG): carbon dioxide, methane, nitrous oxide and others. Since the industrial revolution around 1750, these greenhouse gases have increased significantly due to human activity. By 2011, the atmospheric carbon dioxide concentration exceeded pre-industrial levels by about 40 percent, methane by 150 percent, and nitrous oxide by 20 percent. Scientists analyzed ice cores and found that the present day has experienced the highest concentrations of carbon dioxide and nitrous oxide in the past 800,000 years (IPCC 2011, 11).

Human society is socially, economically, and physically structured around the use of fossil fuels, creating a large barrier to reducing GHG emissions. Human activity that creates the major portion of GHG emissions includes agriculture, energy and electricity,

land use change, and transportation and industry. The structural fossil fuel dependence of human activity means moving away from their use could restrict economic growth and development.

### **1.1 Human Health Impacts**

Agriculture contributes to carbon dioxide emissions in multiple ways, and generates about 10 to 12 percent of global GHG emissions (Friel et al 2009).

Deforestation to create arable land one major source of emissions, but most of the emissions come from the livestock sector. In the farming sector itself, emissions source from off-farm activities or external inputs to farming, including storage, distribution, fertilizers and pesticides, and application of inputs with tractorized equipment (Lal 2004). Partly due to these very fossil fuel-heavy inputs and methods, crop yields are in danger across the globe from global warming and changes in precipitation. Decreases in crop yields due to rising temperatures are occurring especially in the tropics and sub tropics, which house most of the world's population, and especially the impoverished who already suffer from hunger on a large scale (Weubbles and Jain 2001). Coastal erosion is also contributing to pollution of water used in agriculture (Weubbles and Jain 2001).

In addition to increasing hunger due to damage to crop yields, climate change is a significant threat to human health. Higher frequencies and intensities of heat waves contribute to increased occurrences of cardio-respiratory illnesses, and exacerbate the health effects of pollutants from fossil fuels (Weubbles and Jain 2001). More frequent and intense natural disasters and extreme weather have increased in exposure to people, especially in developing countries (IPCC 2011, 9). The changing climate also inspires changes in the geographic distribution of disease factors such as mosquitos and parasites

(Weubbles and Jain 2001). Higher temperatures negatively impact water supplies and increase microorganism proliferation and subsequent diseases, such as cholera. Finally, food and water shortages could cause widespread psychological harm, as well as economic and social disruption (Weubbles and Jain 2001).

## **1.2 Ecological Impacts**

Ecology in many different geographies is altering due to climate change. A wide range of organisms are changing behaviors and locations to adjust. Researchers have found that more than half of the species studied exhibited changes in their phenotypes or distribution in the past 20 to 140 years (Parmesan 2006, 641). Additionally, these changes occurred in the direction expected from regional changes in climate (Parmesan 2006, 641). Many species are shifting poleward in latitude and upward in elevation to adapt to warming temperatures. Range boundaries in the Northern Hemisphere have shifted up to 6.1 km North and 6.1 km upward (Parmesan 2006, 641). These unknown habitats could be damaging to the species' reproductive capabilities and range (Walther et al 2002). Climate change has also contributed to asynchrony among interacting species that has a negative impact on both species' survival in the majority of the cases (Parmesan 2006, 644). Some studies have revealed evolutionary responses among species in response to climate change, but scientists found these responses are not sufficient to prevent the predicted species extinction due to the rapidly changing climate (Parmesan 2006, 657). These extinctions and changes among species will undoubtedly have damaging effects to other species and the ecologies they inhabit. This damage will likely have economic impacts for humans due to diminishing or changing natural resources, but the damage

may also cause social disruption because of the intrinsic value humans hold for non-human species.

### **1.3 Economic Impacts**

Although estimating the economic cost of climate change is highly complex and predictions range drastically, one study estimated an annual worldwide aggregated impact of negative \$522 billion, or 2.7 percent of the world's income (Tol 2002, 65). Recent estimates calculate the damage of sea level to the OECD alone to be \$25 billion (Tol 2002, 58). The United States is predicted to face \$1 to 10 billion per year in additional energy costs (Tol 2002, 62). Undoubtedly, economic impacts will be a large driving factor for leaders of nations to act now to mitigate and slow the effects of climate change.

However, there may also be significant economic costs to reducing carbon emissions. Research is split on the long term economic effects of cutting back on fossil fuel use. Some researchers found that reducing emissions has either no effect on long-term growth, or a positive effect on growth (Raymond and Smulders 1993, 46). However, a significant portion of the literature predicts a negative relation between economic growth and environmental care (Raymond and Smulders 1993, 45). There is concern that the detriment to large industries such as petrochemicals and fossil fuel companies, as well as to governments enforcing stricter emissions controls, will be damaging to many nations economies and world economic growth (Hart and Ajuha 1996, 31). This precarious circumstance of economic or environmental damage requires innovative policy mechanisms to ensure positive effects for both fields.

This thesis will examine the urban planning method, New Urbanism, as a possible solution to reduce carbon emissions. Cities now make up a large part of the world's carbon emissions, largely due to their organization, which often encourages high carbon lifestyles. There are many examples of cities reducing their carbon emissions drastically by re-structuring the city to discourage car use and encourage walking, biking, and transit use. New Urbanism is one style that has helped cities reduce their carbon emissions, but the planning strategy still faces many barriers and remains relatively limited in spread. In order to examine the potential for New Urbanism as a development solution to global climate change, this thesis will examine if it can be successful at reducing carbon emissions and also retain economic and political feasibility. Success in urban planning is defined for this thesis as a reduction in vehicle miles travelled (VMT) and vehicle trips; and an increase in the proportion of the population taking mass transit, walking, or biking to work. These parameters are used because one of the largest ways individuals contribute to emissions is through automobile transportation. The parameter of vehicle trips is included because vehicle miles travelled could be lower simply because of the proximity of amenities to a home. Although this proximity is important for reducing greenhouse gas emissions of individuals, the emissions can be reduced further if people walk and use transit rather than drive. A high number of vehicle trips still means the urban design could be doing more to reduce the carbon footprint of the neighborhood. The final parameter, the commuting method, is important as a factor that can account for why the VMT may be low. In order to measure how successful the urban design is in reducing the carbon footprint of those residents, this thesis must also determine the proportion that uses transit, biking, or walking to work. Economic and political feasibility

are determined by examining case studies, financing, fiscal impact, housing prices, and the many different perspectives and contextual factors that play into the viability of a planning strategy. Through the analysis, this thesis finds that in many contexts New Urbanism is both a feasible and advisable strategy for reducing carbon emissions. After examining the barriers, measures to be implemented by developers, advocates, and governments that enable New Urbanism to spread and have the largest positive effect are outlined.

## **Chapter 2 Background Trends and Policy Solutions**

Policy makers have incorporated many tools to reduce environmental damage while minimizing negative impact on the economy. Governments across the world have incorporated command and control regulatory regimes to cut down carbon emissions, and more recently, economic market methods such as cap and trade and the carbon tax have taken root as potential solutions. Additionally, non-profit organizations and governments have emphasized individual behavior changes to address carbon emissions from the ground up. Presently, it is unclear what policy mechanisms will be successful in sustainably combatting climate change without damaging the economy.

### **2.1 Climate Change Trends**

Although there has been debate in recent years as to the origins of increased GHG concentrations, the International Panel on Climate Change (IPCC) has identified anthropogenic influence as the dominant cause of observed warming since the mid 20<sup>th</sup> century. Fossil fuel combustion and cement production by humans have released a total of 375 gigatons of Carbon (gtc), deforestation and land use change produced 180 gtc, cumulatively releasing 555 gtc into the atmosphere. Evidence of greenhouse gas concentrations, positive radiative forcing, observed warming, and understanding of the climate system informed the IPCC's conclusions. Over half of the global average surface temperature rise from 1951 to 2010 was caused by anthropogenic forces, likely equaling a range of about 0.5 to 1.3 degrees Celsius. It is also likely that humans influenced the changes in the global water cycle, the retreat of glaciers, and global mean sea level rise (IPCC 2011, 12, 13, 17).

Future climate change will depend greatly on the trend of GHG emissions. Scenarios for “business as usual,” which project emissions as if humans take no action to reduce fossil fuel combustion, predict far more damaging climate change effects in the future. However, some effects are seen in all or most emissions scenarios. The global surface temperature is likely to exceed 1.5 degrees Celsius relative to temperatures from 1850-1900. Extreme precipitation events will intensify and become more frequent over most mid-latitude landmasses and tropical regions by the end of the century. The effects of the El Nino Southern Oscillation (ENSO) will intensify and dominate the climate system. The top 100 meters of the ocean will likely warm by about 0.6-2.0 degrees Celsius. Scientists predict a year round reduction in arctic sea ice extent by about 43 to 94 percent, and glacier volume will likely decrease by 35 to 85 percent. The IPCC concluded, “most aspects of climate change will persist for many centuries, even if emissions of CO<sup>2</sup> are stopped” (IPCC 2011, 19,20, 23, 24, 27).

## **2.2 Technology Trends**

In order to understand how to effectively address the problem of climate change, it is necessary to analyze the solutions that policy makers and firms have employed. Historically, command and control has been the primary method for policy makers to regulate environmental damage. Governments are still using regulatory policies, but there has been a shift to market-based approaches such as a cap and trade systems or carbon taxes (Swaney 1992, 623). Both approaches have seen successes and failures, although market-based methods have not been in effect for as long and have fewer results to study (Avi-Yonah and Uhlmann 2009, 34). The major portion of solutions that have been

suggested or applied to reduce GHG emissions fall under one of these two approaches, outside of the more individual-based campaigns.

### *Renewable Energy and Energy Efficiency*

In response to society's realization of the extraordinary damaging effects of climate change on many aspects of the world, political, economic, and social leaders have proposed many solutions. Energy from electricity and heating operations make up 61 percent of global GHG emissions (Stern 2007, 1). In replacement of or coupled with reducing energy use, many nations, firms, and individuals are switching to renewable, zero carbon emission energy sources. This includes bioenergy, solar, geothermal, hydro, wind, and ocean energy, and many of these technologies are already mature and being deployed at a large scale (IPCC 2011, 2). From 1991-2001, wind power experienced market growth of over 22 percent per year (Robert et al. 2003, 108). Solar PV's market growth has averaged a 15 percent increase since the mid 1980s, and by 2000 it was averaging 40 percent growth per year (Robert et al. 2003, 111). By 2013, renewable energy made up 11 percent of the total energy use worldwide (EIA 2013, 2). The European Energy Council published that 340 million tons of GHG Emissions, or seven percent of 1990 totals, in the European Union had been reduced due to renewable energy use alone (2012). The major challenge facing the renewable energy industry is competing with the low prices of fossil fuel based energy (IPCC 2011, 11). However, technology is on the advance in efficiency and effectiveness due to the rapidly increasing demand and deployment spurred by government policies that reduce transaction costs and increase fossil fuel prices (IPCC 2011, 6). An important aspect of this method of approaching the

climate change problem is enabling policies that support renewable energy development and deployment (IPCC 2011, 23).

In addition to replacing the sources within the energy sector with non-emitting sources, increases in energy efficiency can reduce the demand for energy. There is always an energy efficiency gap between optimal energy use and existing energy use, which can be reduced through technological innovations (Jaffe and Stavins 1994, 804). Many advocates and policy makers warn that reducing demand for energy is essential to addressing the damagingly high level of human emissions (Gillingham et al. 2009, 1). About 57 percent of carbon reduction in the U.S. is projected to come from energy efficiency measures (Kutscher 2007, 3). These measures potentially have the ability to keep carbon emissions from rising through 2030 (Kutscher 2007, 3). However, in order to reduce emissions below existing levels, renewable energy deployment and other mitigation measures are needed (Kutscher 2007, 3). Reducing demand, as well as fossil fuel based energy, can be encouraged through cap and trade systems or carbon taxes.

Deployment of renewable energy and energy efficiency measures to reduce fossil fuel use is a necessary step to reducing carbon emissions. However, this will be a more difficult task because of the infrastructure set up throughout the world for fossil fuel use. This includes the transportation network that is highly dominated by cars, and the design of buildings and cities that require large amounts of electricity. The process of reducing carbon emissions would be sped up if these solutions were employed simultaneously or even jointly.

### *Geo-engineering*

Some technologies are being developed to enable to the continued use of fossil fuels while simultaneously mitigating climate change effects. One such technology is geo-engineering, which changes Earth's radiation balance to mitigate carbon dioxide induced climate change (Govindasamyand and Caldeira 2000, 2141). Typically geo-engineering involves placing reflectors or scatterers into the stratosphere or in orbit between the Earth and sun to diminish the amount of solar radiation incident on Earth (Govindasamyand and Caldeira 2000, 2141). Researchers predicted that increases in average global temperatures could be cancelled by preventing just 1 percent of incoming solar radiation from reaching the Earth (Teller et al. 2009, 2). This diminished solar radiation would mostly occur during the daytime and at the equator. The over all effect would be to diminish the equator pole gradient, and create less of a seasonal cycle (Govindasamyand and Caldeira 2000, 2141). However, the geo-engineered climates are predicted to be only significantly different in surface temperature on 15.1 percent of the Earth's surface, concentrated around the equator (Govindasamyand and Caldeira 2000, 2142). The estimated costs would be up to \$1 billion per year. Geo-engineering has been naturally tested by the eruption of Mt. Pinatubo in the Philippines, which spewed volcanic Sulfur Dioxide particulates that scattered sunlight (Teller et al. 2009, 9). The eruption caused a transient drop of global mean temperature by 0.5 degrees Celsius, indicating that scattering sunlight does have the ability to reduce global temperatures (Teller et al. 2009, 9).

One method of geo-engineering is to place aerosols into the stratosphere to scatter the solar radiation (Govindasamyand and Caldeira 2000, 2142). However, studies show

that aerosols could have adverse impacts on the chemistry of the stratosphere (Govindasamyand and Caldeira 2000, 2142). The other major option for diminishing the solar radiation incident is to place reflector disks into orbit (Govindasamyand and Caldeira 2000, 2143). However, in order to intercept 1.7 percent of the sunlight incidence to counteract a doubling of CO<sub>2</sub>, the disk would need to be about 800 km in radius, and it would need to increase by 12,000 km<sup>2</sup> per year to keep up with increasing carbon dioxide concentrations (Govindasamyand and Caldeira 2000, 2143). These geo-engineering systems have high risks of extremely rapid warming if they fail (Govindasamyand and Caldeira 2000, 2144). Even if they were to successfully operate, ecosystems would be impacted by the change in carbon dioxide atmospheric concentrations, and in sunlight availability. If reflectors were used in low Earth orbit, flickering could occur around 2 percent of the time, which could hamper with tracking and lead to collisions of the very expensive reflectors (Govindasamyand and Caldeira 2000, 2144). Additionally, international consensus on how to create and manage a geo-engineering system would be extremely difficult (Teller et al. 2009, 17). Based on these risks, costs, and legislative challenges, geo-engineering is not the best method for climate change mitigation.

#### *Carbon Capture and Storage*

Another technology that allows for continued use of fossil fuels is carbon capture and storage (CSS), which stores the carbon dioxide emissions from fossil fuel burning sources and stores it into deep geological formations (Wilson et al., 2007, 5945). The International Energy Agency estimates CCS could remove about 79 gigatons of carbon dioxide between 2010 and 2050 (Markusson et al. 2012, 904). Marshall (2012) published for Discovery News (November 27, 2012) that human contribution to emissions was 35

gigatons in 2010, indicating that a yearly reduction of 79 gigatons would be substantial in mitigating climate change. There are high risks associated with this technology. Because of the large quantities of carbon dioxide that must be injected, there is danger of the buoyancy of CO<sub>2</sub> leading it to rise into the subsurface and contaminating major water supplies (Wilson et al. 2007, 5945). Additionally, a lot of time is needed for CSS to have a positive climate benefit (Wilson et al. 2007, 5945). Ensuring safety from these risks requires extensive legislation. However, much the framework has already been set up for other underground activities and can be altered and applied to CSS (Wilson et al. 2007, 5945). A final challenge for CSS as a solution to climate change is that it must be deployed at a very large scale—9 million tons of carbon dioxide must be injected into a 100-meter thick geological formation for a 30-year fossil fuel plant lifetime. The resulting subsurface pool of carbon dioxide is roughly 120 km<sup>2</sup> (Wilson et al. 2007, 5946). An additional complication to CSS technology is that the risks are less well understood than for many other technological solutions for climate change (Markusson et al. 2012, 908). Although additional research into CSS technology is needed to decisively determine its effectiveness in mitigating climate change, the current technology is more dangerous and costly than alternative solutions.

### **2.3 Governmental Efforts**

All levels of government have been involved in regulations and legislation aimed to reduce GHG emissions. Although this thesis will be focusing on the American context, international case studies are provided in order to learn from best practices. Policy lessons can be extracted from these examples and applied in varying contexts.

### *Cap and Trade and the Carbon Tax*

The long term economic and carbon-reduction effects of a cap and trade system or a carbon tax cannot be assessed. Cap and trade and carbon taxes allow market mechanisms to achieve emission reductions. Regional tests have produced mixed results (Avi-Yonah and Uhlmann 2009, 34). The United States used a cap and trade system in 1990 to curtail acid rain with success. However, the system was not economy-wide, so the results cannot be used to predict a larger scale cap and trade system (Avi-Yonah and Uhlmann 2009, 34). Carbon taxes have been adopted in many Northern European countries with success, including Denmark, Finland, the Netherlands, Norway, and Sweden (Avi-Yonah and Uhlmann 2009, 34). In Norway, researchers found their carbon tax reduced emissions by only 2.3 percent, and decreased GDP by 0.1 percent, indicating the tax was not a cost effective means of emissions reduction (Bruvoll and Larsen 2004, 500). However, most taxes are too new for policy makers to draw definitive conclusions (Avi-Yonah and Uhlmann 2009, 34). Many countries, including the United States, continue to work on creating effective cap and trade systems and carbon taxes (Avi-Yonah and Uhlmann 2009, 35). More research and testing is needed to determine if these tools are viable ways to reduce carbon emissions without causing significant economic damage.

### *International Level*

Historically, experts have recognized the necessity of reaching consensus at the international level about emission targets and actions to combat climate change. The United Nations first established a Framework Convention on Climate Change (UNFCCC) in 1990, which paved the way for international treaties and agreements at the Earth

Summit in Rio de Janeiro, and the Kyoto Protocol in 1997 with mandatory limits on GHG emissions (Avi-Yonah and Uhlmann 2009, 17). Unfortunately, the Kyoto Protocol was not effective, because even the 38 industrialized countries that ratified the agreement were not able to meet the minimal commitments to GHG reductions (Huang et al. 2008, 245). Nearly all international environmental agreements have failed to reach their reduction goals, especially due to lack of participation from developed countries such as the United States (Avi-Yonah and Uhlmann 2009, 34). The European Union is the only geopolitical region that has adopted a binding unilateral GHG reduction target for 2020 (Bohringer et al. 2009, s295) However, the UNFCCC continues to operate in research and finding international solutions to climate change issues (Avi-Yonah and Uhlmann 2009, 18).

#### *National and Sub-National Level*

On the national level, many countries including the United States have set regulatory limits such as emission controls, technology forcing requirements, and emission permit limits. In the United States much of the emissions regulation is routed through the Clean Air Act, which can regulate CO<sup>2</sup> emissions based on its definition as an air pollutant (Avi-Yonah and Uhlmann 2009, 8). Carbon dioxide was first included in permitting by the Environmental Protection Agency in January of 2011 (EPA 2011). Fuel economy standards for cars were implemented to boost fuel efficiency by about 21.5 percent from 2012 to 2016 (US DOS 2010, 3). The government also committed to reducing carbon emissions to 17 percent below 2005 levels by 2020, and 83 percent below by 2050 (US DOS 2010, 3). Recently, the United States government has implemented emissions standards for future and existing power plants with the goal to

reduce emissions (NRDC 2014). However, many of the most effective and innovative policy solutions have come through state and local government. California has been especially aggressive in passing legislation for emissions reduction, and set a target for emissions to be 15% below business as usual levels by 2020. Over 500 mayors across the nation have pledged to reduce GHG emissions (Avi-Yonah and Uhlmann 2009, 20). Smaller governments can more easily maneuver legislation because they are burdened with less bureaucracy, and also face fewer challenges in gaining support in smaller, more unified populations.

In order to further understand the trends in policy making for climate change mitigation, successful international case studies are examined.

#### *Case Study: Sweden*

Jenkins (2012) performed an analysis to determine the nation with the fastest rate of decarbonization since 1970. According to this research, Sweden had almost double the decarbonization rate of the other OECD nations. Primarily in response to the oil shocks of the 1970s, the Swedish government worked to replace oil primarily with nuclear. Today, Sweden's primary energy mix is 65 percent zero-carbon made up of a blend of renewable sources. The main sector that did not see a reduction in oil use is transportation (Jenkins 2012). The salient factor in Sweden's decarbonization was the active role of the state in driving energy technology development and deployment (Jenkins 2012). In order to accomplish the reduction in emissions, the Swedish government used a combination of mandatory environmental code requirements and voluntary energy efficiency programs (Institute for Industrial Productivity 2013, 1). The voluntary energy efficiency program did not produce significant emissions reduction, nor is it projected to be significant

moving forward (Swedish National Audit Office 2013, 1). The technology procurement program starting in 1990 also played a role in the fast rate of decarbonization in Sweden (Institute for Industrial Productivity 2013, 2). The program facilitated the process for suppliers to bid on contracts for the production of new technology. This program was determined to be a vital component to the speed with which the energy market transformed to emit lower levels of greenhouse gases (Lewald and Bowie 1993, 94). Environmental taxes were also used to reduce emissions at a low administrative cost (Nyman 1998, 7). However, these taxes have possibly put Swedish companies at a disadvantage because of the lack of coordination on an international carbon tax system (Nyman 1998, 8). Overall, Sweden was able to reduce its carbon emissions so quickly because of the active role of the State in primarily economic policy tools. However, the lack of reduction in fossil fuel use in the transportation sector indicates that more gains could have been gained by investing in urban design to lower car use, and in public transportation especially utilizing low- or zero-emission energy uses.

#### *Case Study: Germany*

Germany is one of a few nations<sup>1</sup> that has decoupled GHG emissions and economic growth. In the 2000s the nation saw robust economic growth and is now the third largest economy in the OECD. Simultaneously, Germany further developed its existing ambitious environmental policy framework, resulting in significantly reduced emissions levels. In 2010, emissions were 24 percent below 1990 levels. The success of Germany in emissions reduction and economic growth comes from strong environmental

---

<sup>1</sup> Others that have made significant progress toward decoupling include South Africa and China (UNEP 2011)

policies, strategic funding of research and development, and market-based policies (OECD 2012, 1-2, 4).

Undoubtedly, a large portion of the reduction in emissions that occurred in the 2000s came from increasing oil prices and the global economic downturn. However, analysis reveals that regulatory and market-based policies with an effective policy cycle of re-evaluation and political commitment was instrumental in the reduction. Much of the reduction came from the switch to renewable energy. The German government used feed in tariffs (FITs)<sup>2</sup> to guarantee a price for producers of renewable energy, and require grid operators to give them priority over fossil fuel energy producers. Additionally, the cost of FITs is paid by electricity consumers directly, not taxpayers, avoiding the potential negative effect on overall spending. The state has also expanded research and development support, and shifted financial investment from fossil fuel producers to the renewable energy sector (OECD 2012, 4).

The ecological tax reform in the late 1990s and early 2000s was a market-based policy that the German government used to tax electricity consumption and increase excise taxes on fossil fuels. Estimates reveal that the tax reduced energy consumption and GHG emissions while producing positive employment and other economic effects. However, the failure to adjust the tax rates for inflation, and the choice to exempt entire carbon-dependent sectors from the tax has limited its effectiveness. OECD researchers found Germany could achieve additional savings through further investment in energy efficiency, especially through reducing the carbon emissions from the residential sector.

---

<sup>2</sup> FITs offer long term contracts to renewable energy producers depending on the cost of generation for the technology. The price is ratcheted down over time to encourage cost reductions (Couture et al, 2010).

Overall, extending the use of market-based incentives would help Germany achieve environmental goals more cost effectively (OECD 2012, 6-7).

#### **2.4 Corporate Social Responsibility and Individual Action**

Beyond governmental policy, many corporations are taking voluntary measures to reduce environmental impact through initiatives described as Corporate Social Responsibility<sup>3</sup> (Avi-Yonah and Uhlmann 2009, 21). Businesses have been attempting to mitigate damage they cause or otherwise promote socially responsible causes since the 1950s (Carol 1999, 268). However, this focus became widespread among large companies starting in the 2000s with the creation of CSR positions and departments. A *Wharton School of Business* study reported in *Time Magazine* noted that only 49 Fortune 500 companies issued CSR reports in 2002, but the majority of companies had done so by 2012. However, researchers predict that voluntary measures at firms alone will not produce the necessary reductions at a fast enough pace (Avi-Yonah and Uhlmann 2009, 21). Non-profit institutions have also formed in recent years promoting voluntary carbon emission reductions at the individual level. Stein and Beckel (2006) that non-profits Sierra Club and Environmental Defense have a cumulative 1.2 million members, and many other groups such as Greenpeace, World Wildlife Fund, and the Wildlife Conservation Society have similarly large memberships and employee bases. Methods used to promote voluntary reduction include expensive communication campaigns that have been shown to be ineffective (Ockwell et al. 2009, 1). Although concern about climate change has increased, public opinion research reveals that in the context of other

---

<sup>3</sup> CSR according to a large body of academic research entails corporate communication campaigns, stakeholder engagement, corporate orientation, internal departments, and management positions (Lindgreen and Swaen 2010).

issues, climate change takes a low priority despite these campaigns (Ockwell et al. 2009, 2). Generally there is a high cost associated with reducing personal carbon emissions, which is a large deterrent for the average individual (Ockwell et al. 2009, 2).

Additionally, many people view climate change as a problem facing future generations and other countries, making taking action less pressing (Ockwell et al. 2009, 2). Finally, individual behavior is constrained by the high carbon emission infrastructure and institutions in place (Ockwell et al. 2009, 2). Due to these challenges, many question whether grassroots initiatives encouraging voluntary carbon reduction are adequate to respond to the scale and urgency of the climate challenge.

A large part of what constrains individuals from adjusting their lifestyles to have lower fossil fuel emissions is the physical set up of cities and towns in which they inhabit. Energy and land use changes account for most of the anthropogenic GHG emissions (Stern 2007, 1). Land extensification depends directly on the compactness of human settlements, and energy use depends indirectly on the linkage of this compactness with mobility patterns of humans (Camagni et al. 2002, 200). There is a widespread verdict that sprawling development, especially on the urban fringe, consumes land resources and causes high infrastructure and energy costs, congestion in transport networks, segregation of populations and land uses, and environmental degradation (Camagni et al. 2002, 200). The physical infrastructure of cities must be adjusted in order to remove the barriers to reducing GHG emissions.

## **2.5 Sustainable Development**

Scholars have identified urban development as both a challenge for emissions reduction and a potential solution. Due to the concentration of people, commerce, automobiles, and waste, urban areas constitute 75 percent of global energy consumption and 80 percent of GHG emissions (Dodman 2009, 186). However, on average, per capita emissions are lower for city residents than their rural counterparts (Dodman 2009, 186). Significant reduction in emissions can come from redesigning urban systems to encourage things like density and public transit use. Transportation activity resulting from development patterns constitutes around 33 percent of U.S. GHG emissions, and similarly large percentages in other developed nations (Condon et al. 2009, 6). Researchers also estimated GHG reductions of up to 10 percent could come from changes in land use alone (Condon et al. 2009, 6). Two thirds of development by 2050 will be new or redeveloped since 2007, leaving room for planners to incorporate sustainable development and reduce cities' carbon footprints (Condon et al. 2009, 6). The trend since the 1950s has been decidedly diverging from the traditional urban development pattern. Low-density sprawl and suburban development have dominated development due to individual family preferences, as well as government policies that distort behavior (Meredith 2003, 471-473).

A conventional suburban development is low-density and single-use neighborhoods with large residences lots. These developments contain no on-site employment or commercial amenities, and have wide, discontinuous streets without walkable paths (Pushkar et al. 2000, 12). One study found these neighborhood types emit 25-40 percent more than traditional urban neighborhoods (Pushkar et al. 2000, 14). The Lincoln Institute of Land Policy found that per capita energy consumption and GHG

emissions are 2 to 2.5 times higher in low-density developments as compared to high-density areas (Condon et al. 2009, 8). Despite the inconvenience of commute times and car use, a portion of the popularity of suburbs stems from individual preferences based on better prices, school services, social comfort, and safety (Meredith 2003, 471). However, transportation policies that subsidize car use so that car owners do not have to pay the full cost of their carbon emissions also contribute to the rising sprawl (Meredith 2003, 475). In addition, the Federal Housing Administration has put in place planning policies over the past 50 years that encourage low-density development (Meredith 2003, 475).

### *The New Urbanism*

Planners developed the doctrine of New Urbanism in response to sprawl development patterns and policies. This doctrine incorporates neo-traditional neighborhood development as promoted by Andres Duany and Elizabeth Plater-Zybek (Kreiger and Lennertz 1991). Other leaders of the movement who promoted pedestrian orientation and transit-oriented design include Peter Calthorpe and Douglas Kelbaugh (Bohl 2000, 762). New Urbanist development includes mixed uses, town centers with accessible public space, pedestrian orientation, and diversity (Meredith 2003, 478). The doctrine operates most strongly at the neighborhood or district level. At the regional level, the movement does not provide specific guidance (Meredith 2003, 487). Movement leaders published their planning policies in the Traditional Neighborhood Development framework (Meredith 2003, 485). As emphasized above, neo-traditional neighborhoods significantly reduce CO<sub>2</sub> emissions as compared with suburban areas (Pushkar et al. 2000, 14).

### *Critiques of New Urbanism*

New Urbanism has failed to become the dominant planning strategy. *New Urban News* has characterized around 25,447 units in projects qualifying as New Urbanism completed, under construction, or in planning stages on average yearly from 1981 to December 2003 (Song et al. 2009, 1). A rough estimate covering the 1981-2003 time period of the yearly average number of total residential units permitted, started, or completed in the U.S. is 4,382,700.<sup>4</sup> Using this estimate, New Urban residential units are around 0.6 percent of the total residential units permitted, started, or completed yearly, from 1981 to 2003 (US Census 2003). The number of residential units in New Urban developments is therefore a small percentage of the total residential construction since the 1980s. Often these developments are subdivisions rather than whole towns, and rely on private management rather than governmental control.

“Nostalgia” is a theme throughout most arguments against the New Urbanism planning doctrine, which speaks to an escapist desire to return to a simpler, imaginary past. More specifically, critics argue New Urbanism ignores the social and economic realities of modern day, including the prevalence of the automobile, cheap energy, new building technologies, and globalized trading spheres (Ellis 2002, 268). Critics also maintain that culturally, people are mobile, individualistic, and value privacy over community and convenience over quality (Ellis 2002, 268). Additionally, to some, the architecture in many New Urbanist projects is “kitschy” and denies historical change and

---

<sup>4</sup> Using historical US Census Bureau records of residential construction, the average was taken from the number of residential units permitted, started, or completed in 2-year increments (1995, 1997, 1999, 2001, and 2003). Historical data was unavailable for years before 1995. The total number of New Urban housing units was then divided by 22, the number of years over which construction took place. The yearly average number of residential New Urban units was divided by the yearly average total number of residential units.

individual inspiration (Ellis 2002, 274). Scholars particularly analyzing projects in the Southwestern United States, have concluded that the New Urbanism model of the traditional American town denies the process of change, and ignores regional variation in cultural tradition (Veregge 1997, 60). In rebuttal, New Urbanists argue it is common practice for planners of any doctrine to draw upon codes, pattern books, and building typologies (Ellis 2002, 274). New Urbanists generally draw upon the traditional local vernaculars to create an authentic, rather than manufactured, sense of place (Ellis 2002, 274). Planners argue that they put significant consideration into the context of the neighborhood or community, and work to modernize historical patterns and elements to make them compatible with life today (Ellis 2002, 266).

Another argument in the anti-New Urbanism literature is that New Urbanism has little urbanity. The utopian small town America that New Urbanists advocate is likely to suppress cultural differences and density found in urban areas. Many prominent New Urban projects are of moderate density and are set in a suburban landscape. However, there is no rule in the codebook that dictates New Urbanism must take place in the suburbs, and many newer projects are more urban, including such communities as Liberty Harbor North in New Jersey, Crawford Square in Pittsburg, and Downcity in Providence. These small neighborhoods also cannot simply be glued together—New Urbanist planners envision a city with neighborhoods connected by boulevards, major commercial streets, parks, and plazas. Additionally, many aspects of the New Urbanism draw upon design patterns from cities such as San Francisco and Pittsburg (Ellis 2002, 276, 269).

The final significant critique of new urbanism is that is socially and racially exclusive. These critics draw on examples like Seaside, Florida, and the Disney-owned

Celebration, Florida (Bohl 2000, 782). These and other earlier suburban projects are predominantly upper-middle-class white communities that promote class and racial segregation (Ellis 2002, 279). However, Congress for the New Urbanism (CNU) has always advocated infill and mixing income groups, as well as affordable housing that looks like “normal” housing (Ellis 2002, 280). 95 percent of current building activity is in suburbs, so rather than attempting to fight growth at the fringe, New Urbanists find it more constructive to ensure that new growth includes a range of housing types, walkable streets, and a transit oriented design (Bohl 2000,781). Additionally, Urban Design Associates have been building New Urbanist communities in inner-city redevelopment projects since the 1970s (Ellis 2002, 279). New Urbanist projects especially since the late 1990s have focused more on inner-city infill development.

The most prominent example of this is the U.S. Department of Housing and Urban Development (HUD), which committed to incorporating New Urbanism in 1996 (Bohl 2000, 764). From 1993-2009 HUD gave grants through its HOPE VI for replacing public housing projects with mixed-income, New Urban developments (Bohl 2000, 764). The project financed over \$3.5 billion for about 53,000 units (Bohl 2000, 765). The housing units are meant to be indistinguishable from the types of housing in the community, and are interspersed throughout communities (Day 2003, 84). The Congress for New Urbanism worked closely on the HOPE VI to develop New Urban design principles (Bohl 2000, 764). HUD developed flexible zoning standards to allow mixed-use development, public parks, historic preservation, mass transit connections, and pedestrian-friendly design mechanisms (Bohl 2000, 764). Scholars are hopeful that with more emphasis on a regional formula, affordability, and on infill rather than development

on the edges of cities, New Urbanism could be a potential solution to the sprawl problem (Meredith 2003, 495).

#### *Transit-oriented Development (TOD)*

One aspect of the New Urbanism doctrine, transit-oriented development (TOD), is itself an urban planning strategy that is considered a potential solution to the sprawl problem. Transit-oriented neighborhoods often consist of a center with a public transit station surrounded by high-density development (Holmes and van Hemert 2008, 4). Not only must the neighborhood be adjacent to a transit stop, but the community must also be centered around transit, including pedestrian friendly and automobile unfriendly design (Holmes and van Hemert 2008, 4). Governmental policies have been used to encourage TOD, such as Location Efficient Mortgages (LEMs), which make it easier for residents in TODs to qualify for home mortgages due to their freed up income from fewer cars (Cervero and Duncan 2002). In the United States in the year 2000, six million households were located within a half mile of a public transit stop, and researchers estimate 16 million will want to live near a transit stop by 2030 (Holmes and van Hemert 2008, 4). 45 percent of TOD residents walk, bike, or take transit to work, compared with just 14 percent in non-transit neighborhoods (Holmes and van Hemert 2008, 6). They also drive half the vehicle miles per year compared with suburban residents, which significantly reduces residents' carbon emissions (Holmes and van Hemert 2008, 6). TOD is primarily at the neighborhood level and controlled by the policies determined by city planners and officials. However, proponents of the doctrine emphasize the improvement that comes when city officials coordinate with regional transit authorities (Holmes and van Hemert 2008, 5). As an example, the Santa Clara Valley Transportation Authority worked with

cities throughout the region to develop higher, mixed-use densities around transit stops (Holmes and van Hemert 2008, 5). The regional authority was able to identify station locations in areas that would be most feasible to develop more densely, and where this development would be most beneficial to the community and the transit system (Holmes and van Hemert 2008, 5). Although city governments have predominant jurisdiction over land-use and zoning policies, regional understanding and coordination is necessary for the success of transit-oriented development.

### *Critiques of TOD*

Criticisms of TOD often focus on the lack of affordable housing and subsequent lack of socioeconomic and ethnic diversity of residents. One study in the San Francisco Bay Area found residents in transit-oriented neighborhoods were more likely to be younger people working in office or professional occupations who live in one-two person households (Flint 2010, 12). Residents are less likely to be Hispanic or have household incomes below \$30,000 (Flint 2010, 21). However, the predominance of young, single professionals is not necessarily a negative aspect of TOD. Mixed-use areas near transit stops are generally louder and more crowded than other neighborhoods, which often deters families and older people. Young professionals are often attracted to transit-oriented neighborhoods because they are commuting to work and find the proximity of amenities convenient and the density attractive for meeting people. These are not necessarily the priorities of other demographics, so families and older people may be absent by choice, rather than by the urban design. Housing around transit stops is often more expensive even when not developed as TOD, so the TOD design itself may not be the reason lower income people do not often reside in these neighborhoods. However, the

higher housing prices often result in a dominant population of more affluent households that own multiple cars and are not transit dependent (Loukaitou-Sideris 2010, 63). This can add to traffic congestion, making walking or biking to transit stops less appealing.

Other challenges for TOD include economic and physical concerns. Pedestrian-friendly land uses, such as retail and small businesses, often cannot be sustained by market realities. Commercial space may need to be allocated to corporate clients that can afford the high rent in these districts, but that do not attract pedestrian traffic (Loukaitou-Sideris 2010, 63).

Another economic challenge for municipalities is determining the correct balance of development incentives and development fees and requirements for TOD. Some incentives, which improve profitability for developers, include exemptions from density limits, higher building height limits, and reduction in parking requirements. Requirements for things like open space or affordable housing may be important for livability in the community, but they may decrease profitability for developers (Loukaitou-Sideris 2010, 64).

Physical challenges to TOD include the increase in traffic congestion caused by introducing high-density development without a simultaneous modal change to non-auto transportation. Similarly, planners debate the amount of parking to include in transit-oriented neighborhoods so as to not frustrate residents with parking space scarcity, but not prompt more driving trips than necessary. Additionally, there are physical challenges of building close to transit lines, and for attracting residents despite the noise from trains and foot traffic (Loukaitou-Sideris 2010, 63- 64).

Not all of these challenges have an easy fix, and all solutions are dependent on the context of the neighborhood. Economic challenges can be mitigated by planning stations near pre-existing density of people and activities to ensure the project will attract businesses and residents. Using urban design configurations that make high-density development attractive improves acceptability to neighborhoods, and increases pedestrian traffic. Developing strong public-private partnerships reduces costs and ensures desirable amenities that will attract pedestrians. However, developers or municipalities in charge of the project will also need to actively recruit businesses such as neighborhood retail, as well as small shops and restaurants, that are more attractive for pedestrian traffic. Finally, TOD will only be successful if the transit itself is appealing, affordable, convenient, and safe (Loukaitou-Sideris 2010, 64-65).

### *The Greenway Movement*

The Greenway Movement, an approach to reducing environmentally destructive sprawl, has a complex relationship with the New Urbanism. The movement proposes a living network of greenways that allow more people to live near open space, and preserves environmentally sensitive areas in pathways of development. The movement intends to address a range of issues, including the public perception of environmental issues, sustainable development, and growth management. The greenways are usually areas of ecological significance, recreational use, or of historical heritage and cultural value. The movement laments the policies based on area per person that promote ineffective central city parks, rather than protecting areas for their landscape, cultural values, and environmental protection. Reclaiming the natural infrastructure allows easier access to nature for people living across a city, and also helps solve problems like water

run off, the urban heat island, and contributes to natural carbon sequestration. Chris Little published “Little Greenways for America” in 1990, which popularized and explained the Greenway movement. By 1992, six states reported Greenway planning efforts. In 1995, Massachusetts alone was running well over 100 projects. However, if the Greenway movement were implemented on a large scale, greenways would take up one third of landscapes of the nation, state, township, and neighborhood. There is some opposition to this because of the potential sprawl effect that comes with interspersed open space. Fabos argues that since World War II there is a trend toward dispersed or decentralized development patterns, and planners must adjust their approach away from centrality and density (Fabos 1995,1-2, 7, 5, 9, 11).

However, advocates for Greenway infrastructure intend to use the greenways to prevent further sprawling built environment development. The goal of the movement is to create more sustainable suburbs and develop a sense of place throughout cities and towns. Often Greenway Movement principles are combined with New Urbanism by incorporating the natural infrastructure into traditional neighborhood designs, and connecting neighborhoods using greenways. The Greenway Movement has spurred a flurry of initiatives with similar principles, such as “green infrastructure” “conservation development” and “smart conservation” (Walmsley 2006, 253). When combined with sustainable development principles, using greenway infrastructure has led to successful conservation by considering environmental, economic, and social factors in development. Initiatives such as Florida’s Greenways Commission, Maryland’s Green Print Program, and New Jersey’s Garden State Greenways Plan are examples of successful greenway infrastructure projects that increased access to nature and protected sensitive habitats but

did not significantly contribute to further spreading out development (Walmsley 2006, 253, 258, 264).

Sometimes when sustainability is incorporated as a tenet for planning policies, economic development can be sacrificed, and this is perceived to be the rule. However, there are many examples of cities throughout the world that have integrated sustainable economic growth and development. By examining examples of successful sustainable development, key tools can be identified to implement in other cities moving forward.

*Case Study: Copenhagen, Denmark*

Copenhagen, Denmark is one of the best examples of successful sustainable development. In the words of Mayor Jensen: “It was thought that environmentally friendly development would limit economic growth. However, quite the reverse turns out to be true. Green growth can, indeed, boost economic development and the quality of life” (ARUP 2013, 4). City planners incorporated a variety of primarily transportation measures in order to achieve the goal of economic growth alongside sustainable development. Copenhagen is known for its avid cyclers, so planners undertook infrastructure projects to integrate cycling in the design principles by which they operate. They incorporated new cycling lines with prioritization for cyclers into the wider transportation network. Cycling became one of the fastest modes of transport because of these infrastructure changes. Converting auto users to cyclers resulted in 109,596 tons of Carbon Dioxide reduced between 1995-2010. In addition to this environmental success, the cycling system saved the city external costs of over \$42 million since 1995. City planners noted the importance of cities to prioritize density in order to make cycling a viable option, as well as to prioritize cycling and walking infrastructure in urban design.

The city also noticed economic growth was causing traffic congestion that was slowing productivity and the attractiveness of Copenhagen as a place for business. In order to maintain high levels of economic growth, in addition to the cycling system, the city focused on improving the public transit system to reduce automobile use. The main tool for their success was the integration of their metro, bus, and train systems both physically and virtually. There is one ticket for all systems, real time mobile information available to users, and integrated transit stops. For every person using transit rather than a car, their carbon emissions dropped 83%. Additionally, businesses were incentivized to move to Copenhagen due to the fast and reliable system, further enhancing economic and employment growth (ARUP, 2013, 14-15, 18-19). The take away lessons from Copenhagen are to invest in a technologically advanced, integrated, and extensive public and bike transit system in order to attract new businesses and free up government revenue and personal income to spend in the local economy.

*Case Study: Curitiba, Brazil*

Perhaps the most renowned city for its economical public transportation system, Curitiba, Brazil incorporated reduced resource use, pollution prevention, and improved quality of the environment into all of its development plans with enormous success. When the city experienced rapid development in the 1960s, officials decided to focus the development around a public transportation system rather than restrict or slow the development. Primarily motivated by their low budget, the city government pursued many small-scale initiatives that in aggregate produced large-scale change. Planners initiated a new zoning program that moved development concentration from the center and pushed it along linear axels of transit. The density of development near transit lines

increased mobility for city residents to reach jobs and commercial areas, boosting economic growth. New land use legislation encouraged high-density residential development, which reduced land and resource consumption in comparison with lower density areas. Additionally, the city government purchased much of the land along the axels of transit for dense low-income housing to improve their opportunity for economic prosperity through access to jobs. Finally, the government wrote environmental standards which allowed industry to grow and expand, but in a way as to cause minimal harm to the environment and city residents. Industry makes up 20 percent of jobs in Curitiba, revealing the success of these policies in spurring economic growth and development while adhering to high environmental standards. The take away lessons from Curitiba's success are to establish tight coordination between land use legislation, public transit, and the hierarchy of the urban road network. Officials iterated the importance of understanding a city's main economic opportunities and work toward developing those in a sustainable way, through spending the minimum and sparing the maximum (Rabinovitch 1992, 62-63, 65, 67, 72).

### **Chapter 3 Economic and Political Viability of New Urbanism**

Sustainable urban development using New Urbanism and TOD has stood out among the many policy solutions as a feasible method for reducing GHG emissions. However, in order to determine if this is also a viable solution, economic and political factors must be examined. This chapter will outline case studies of successful and unsuccessful examples of New Urbanism and TOD in order to reveal political and economic barriers and successes. The economic viability will then be examined more closely, including an assessment of financing and fiscal impacts.

### **3.1 Case Studies**

#### *Successful TOD: Contra Costa Transit Village*

Robert Cervero and John Landis (1997) identify the Pleasant Hill BART station as one of the best examples of transit-oriented development in suburbia (Cervero and Landis 1997, 325). Planning for the Contra Costa Center Transit Village surrounding the Pleasant Hill BART station started in the early 1980s, and the process continued for over 15 years (Cervero and Landis 1997, 326). The Village is mixed-use and includes 522 residential units, 35,590 square feet of local serving retail, 10 live-work units, 290,000 square feet of office space, and 20,000 square feet of a business conference center (Institution of Transportation Engineers 2010, 5). Additionally, planners employed pedestrian-oriented design, which is evident in many features of the sidewalk and streets (Institution of Transportation Engineers 2010, 5). Vehicles are discouraged from speeding by short blocks, making walking safer and more pleasant (Institution of Transportation Engineers 2010, 5). Additionally, pedestrians are given preference with prominent street markings including cross walks and warning signs (Institution of Transportation Engineers 2010, 5). The pedestrian space is also level with the street,

encouraging drivers to slow down<sup>5</sup> (Institution of Transportation Engineers 2010, 5).

Parking is limited to the capacity needed for the BART stop, further discouraging driving (Institution of Transportation Engineers 2010, 5). There is pedestrian scaled lighting; attractive, wide sidewalks; and interesting building facades to enjoy while walking (Institution of Transportation Engineers 2010, 5). Shops in the Village are required to have large windows on the ground floor to encourage connection between the private space within and the public street life (Institution of Transportation Engineers 2010, 6). There is public open space around the transit stop with seating and public art (Institution of Transportation Engineers 2010, 5). Pedestrian paths directly link surrounding neighborhoods to the BART stop, and a bike/walk trail called the Iron Horse Trail also connects directly to the bike parking at the station (Institution of Transportation Engineers 2010, 5). The connectivity of the pathways makes walking to the BART stop from the surrounding neighborhood easy and inviting.

The financing for the Contra Costa Transit Village came from a public-private partnership between the Redevelopment Authority and private partners, AvalonBay Communities and Millennium Partners (Institution of Transportation Engineers 2010, 9). The benefits of the project are multifold, and including reportedly adding 7,000 jobs to the local economy, and bringing the number of residents within a quarter mile of a transit stop up to 6,000, over 500 more than before the project (Institution of Transportation Engineers 2010, 9). Planners exceeded their goal of a 30 percent reduction in single occupant vehicle use by the employees of the Contra Costa Centre (Institution of

---

<sup>5</sup> Without a raised curb separating pedestrians from street traffic, cars tend to slow down because this “introduces some ambiguity to the prioritized user of the space” (Institution of Transportation Engineers 2010, 5).

Transportation Engineers 2010, 9). In the area surrounding the BART stop, 36-55 percent of residents commute to work via BART, as compared with the Pleasant Hill city average of 16 percent (Cervero and Lindus 1997, 327). Only 55 percent of residents own a car (Flint 2010, 13). The average car ownership is 1.3 per household, half of sprawl-condition vehicle ownership (Flint 2010, 13). Finally, the high density, transit-oriented development did not have a negative affect on the surrounding housing prices (Institution of Transportation Engineers 2010, 9).

The success of the design was largely due to the existence of the Contra Costa Redevelopment Authority that spearheaded much of the planning process, and the use of a concrete plan (Cervero and Landis, 1997, 326). Additionally, a local elected official served as the political champion for the redevelopment and guided the project through to success (Cervero and Landis, 1997, 326).

#### *Successful TOD: Fruitvale Transit Village*

When a new parking garage was approved for construction next to the Fruitvale transit station in Oakland, the Unity Council, a community organization, led the opposition in halting it the project. Many community members felt it would bring unwanted traffic and take up valuable space that could be allocated to better uses for the neighborhood. The neighborhood was in economic stress because the highway system drew manufacturers to cheaper land and labor in suburban areas, taking away the primary driver of the economy and the consumer base in the neighborhood. The neighborhood is primarily low income, and 90% of the population are ethnic minorities. In response to the protests, BART, the City of Oakland, and the Unity Council signed a memorandum of

understanding to form the Fruitvale Policy Committee, which led the planning process for a new mixed-use development around the station (USDOT 2011).

The city adopted new General Plan land use and zoning designations to support higher density mixed use, transit- and pedestrian-oriented uses in the late 1990s (MTC 2006, 3-53). The area around Fruitvale Transit stop was zoned as a commercial shopping district, which allows for a range of commercial uses and relatively high-density residences (MTC 2006, 3-53). The City of Oakland made Fruitvale TOD a high priority for pedestrian improvements in the City's Pedestrian Master Plan (MTC 2006, 3-55). The City capped parking around the transit village to maintain the pedestrian orientation, and also made room for two pedestrian plazas on one of the border streets (MTC 2006, 3-55). Construction of the \$100 million Fruitvale Transit Village began in 1999 and was completed in 2004 (Global Site Plans 2013). It includes 220 mixed income units, 45,000 square feet of neighborhood retail, 114,000 square feet of community services, and a 150-car parking garage (Global Site Plans 2013). Much of the retail is located beneath residential units in a mixed-use fashion. Bike parking is ample, and bus lines run along the outer corridor of the village (Global Site Plans 2013).

BART estimated that 300-600 new daily trips were generated since Fruitvale opened (Rudy Bruner Award 2005, 105). However, as Eliza Strickland (2006) reports, some retail struggled because the commercial space was leased to more expensive businesses than local residents could afford (3). The Unity Council admitted that more residential units were necessary to balance the retail space and provide consumers for those businesses (Strickland 2006, 6). According to Blanca Torres in the SF Business

Times (2013), Phase II of the Fruitvale Transit Center includes 275 new residential units, and is scheduled to begin construction in the next two years.

Analysis of the transit-oriented development revealed that the most influential elements in increasing pedestrian activity and reducing car traffic were those that increased walker safety and connectivity. The new multiple uses in the development put eyes on the street as retailers watch out for the areas around their store, increasing safety throughout the day and night. The narrowed streets, widened sidewalks, pedestrian lighting, crosswalks, and street trees that shade and buffer pedestrians from traffic also were influential in increasing pedestrian use of Fruitvale. Alameda- Contra Costa (AC) transit bus transfers concentrated bus lines and improved transfer times between buses and BART, making use of the transit stop more efficient, and incentivizing using transit rather than automobiles (MTC 2006, 3-56).

*Unsuccessful New Urbanism: Celebration, Florida*

Several cases of New Urban development are examples of unsuccessful application of the tenets of New Urbanism, or of failure to address all of the tenets in full. These examples serve to illustrate the potential problems with New Urbanism in practice, and the difficulty of fully adhering to all the principles in all contexts.

Celebration, Florida was built by the Disney Corporation as a New Urban development (Bartling 2004, 377). Disney chose to design the community on New Urban principles because they can be used to create the idyllic, small town feel that is part of Disney's brand through their theme parks (Bartling 2004, 377). The plans for Celebration did not conform completely to the goals laid out by the Congress of New Urbanism, including the goals of affordability, socio-economic and ethnic diversity, and reduced

driving. However, Celebration is an example of the problems that can come about in the implementation of the New Urbanism planning strategy. Not all developers will implement every aspect of New Urbanism, and some characteristics are unachievable in each locational, economical, or social context. However, in so far as it did adhere to the principles of New Urbanism, Celebration is still a problematic case. The town has faced criticism on many aspects of its design and execution, and is often cited by opponents of New Urbanism. The streets within the community are wide, like most suburban streets, which undermines the goal of New Urbanism to discourage car use through narrower streets (Njoh 2009, 11). The Charter for the Congress of New Urbanism states diversity of both use and population as a primary goal. Celebration lacks both socioeconomic and racial ethnic diversity: Celebration is 87.7 percent white, and predominately upper-middle class, as revealed by housing prices (Njoh 2009, 10). By 1998, the average home in Celebration sold for \$377,300, which is 40 percent more than surrounding top selling developments (Cisler 1999). The average income in Florida is \$42,000, so homes in Celebration are not affordable to the average citizen (Njoh 2009, 9). The vast majority of Disney employees would also not be able to afford to live in Celebration (Bartling 2004, 382). Despite New Urbanism drawing on inspiration from concerns of environmental and natural resource preservation, Celebration is built on suburban land and is part of the urban sprawl because it consumes more land on the fringe without effective transit to connect it with other residential and employment centers (Njoh 2009, 10). Additionally, few employment opportunities are available to residents within the community, so residents must commute to work, further contributing to the GHG emissions from urban sprawl. Many New Urban developments are build on suburban land, so this island effect

where residents still must drive to get anywhere outside of the community is an important consideration when analyzing the effectiveness of New Urbanism as a sustainable development method.

Many of the failures of Celebration as a New Urban town stem from being owned by Disney. As a publicly held corporation, Disney is concerned primarily with maintaining high shareholder value, and requires brisk sales. Although Celebration was intensively marketed as a utopia, because Disney was focused primarily on quickly selling homes, it failed to incorporate utopian elements such as public participation, active community organizations, abundant technology, quality, and on-site education (Bartling 2004, 377, 384). Although not all private developers are as dependent on brand as the Disney Corporation, the case of Celebration is still illustrative of the need for development corporations to please shareholders. Developers respond to financial pressures to sell a large volume of homes in a short time period. This pressure for profit can reduce the implementation of features of New Urbanism that do not directly contribute to selling homes at a high price. Such elements could be quality on-site education or public participation, which the developer can promise to potential buyers in order to increase the attractiveness of the neighborhood, but then fail to fulfill the expectations.

Additionally, Celebration is a greenfield development, so no municipality existed previously on the land Disney developed. Many New Urbanism developments are on greenfield land, and this further allows the developers' focus on profit to control the design of the community. The private developer does not have to negotiate actions with the municipality to the same extent as it might for an infill project within a municipality.

Without the more engaged governmental intervention on the developer's behavior, the company tends to focus even more on selling homes quickly, rather than successfully implementing New Urbanism principles to create an environmentally sustainable and engaged community.

### **3.2 Economic Viability**

The above case studies reveal many barriers to the economic feasibility of New Urbanism as a non-traditional development style. This section serves to outline some of these barriers as well as solutions that have been implemented successfully. It is important to note that every development is planned in a different context, so these barriers may or may not apply to any given project, and additional context-specific barriers may occur.

#### *Housing Price Premia*

Although research has found that there is significant demand for pedestrian- and transit-oriented development, the economic viability of the development approach depends on this demand being reflected in price premia people are willing to pay to live in these neighborhoods (Bartholomew and Ewing 2011, 18). Many aspects of TOD and New Urbanism can result in higher residential property prices, but the relative strength of these characteristics varies across different contexts, as reported in the literature. This is partly due to varying methodologies, although most studies use hedonic pricing to quantify the premia. It is important to note that hedonic pricing does not take into account public regardedness, and therefore may underestimate the value people are willing to pay. Advertising neighborhoods as specifically New Urban or transit-oriented could be an important contributor to premia people are willing to pay for homes in these areas.

Overall, the literature does suggest that homebuyers are willing to pay a price premium for homes in TOD and New Urban areas (Bartholomew and Ewing 2011, Song and Knapp 2003, Tu and Eppli 1999, Bowes and Ihlanfeldt 2001).

Accessibility has a large positive impact on housing prices. When transportation and convenience costs of getting to central locations are lower, demand, and subsequently price, increases. However, proximity to the Central Business District (CBD) has become somewhat less influential in housing prices with the advent of the modern multi-centered urban form, which replaced the pre-1950s single-centered metro pattern. Incorporating transit service to an area increases transportation options for residents and employees of the area and can reduce travel time to the CBD. The majority of empirical evidence shows that introducing transit service to an area leads to higher land values. However, introducing transit service into an auto-oriented environment without also introducing pedestrian-oriented design, planning, and zoning provisions often does not result in significantly higher land values. Finally, accessibility to commercial retail through mixed-use development has been shown to lead to higher property prices, but literature on this topic is somewhat limited. Often the effect mixed-use development has on land prices depends on the type of non-residential uses involved, with the highest benefit accruing from pedestrian-oriented uses, whereas auto-oriented commercial or industrial uses result in the least benefit, or even a price penalty. Additionally, there can be a disamenity zone surrounding the non-residential uses where negative effects like noise, light, and traffic create a price discount. Once again, the size of this price discount zone depends on the nature of the non-residential uses (Bartholomew and Ewing 2011, 20-21, 24, 27).

Specific aspects of New Urban design have also been shown to lead to premiums in housing prices. Generally, residents are willing to pay more for houses in neighborhoods with more connective street networks, shorter dead end streets, more and smaller blocks, and better pedestrian accessibility to commercial uses (Song and Knapp 2003, 235-236). Some of these characteristics, such as small blocks and connected streets, may provide a price premium, but the strength of the effect depends on the presence of other pedestrian design features, such as wide sidewalks, pedestrian level lighting, and landscaping (Bartholomew and Ewing 2011, 27). In auto-oriented neighborhoods, increasing interconnectivity and decreasing street designs like loops and cul-de-sacs can actually lower land prices (Bartholomew and Ewing 2011, 25). Additionally, studies have shown that residential property appreciates faster where developers incorporated traffic calming elements like speed bumps and intersections, than in non-calmed neighborhoods (Bartholomew and Ewing 2011, 25). Finally, proximity to protected open space like parks also provides a price premium, depending on the size of the park, proximity to CBD, and density of surrounding development (Bartholomew and Ewing 2011, 27).

There are many estimates of the strength of the price premium consumers are willing to pay for properties in New Urban or transit-oriented neighborhoods. Most conclude generally that the premium depends significantly on the particular design characteristics of the neighborhood (Song and Knapp 2003, Bartholomew and Ewing 2011, Bowes and Ihlanfeldt 2001). Tu and Eppli estimated a price premium of 12 percent, or around \$25,000 for homes in Kentlands, a New Urban development in Maryland (Tu and Eppli 1999, 447). Generally, the estimated premiums more than

compensate for the price discounts that accrue from the smaller sized lots in these denser developments (Song and Knapp 2003, 236). Researchers hesitate to apply specific price premiums broadly to New Urban or transit-oriented neighborhoods. However, overall the hedonic price literature confirms that the increasing demand for these types of developments is being reflected in real estate prices (Bartholomew and Ewing 2011, 30).

### *Financing*

A sample of lender/investor community attitudes indicates that there is a higher perceived risk with New Urbanism projects because of the high costs associated with high-density, multi-purpose developments, and the uncertainty of the depth of market demand. Investors and lenders found that few developers have successful track records with multiple use projects, rendering them wary in investing in these types of projects. Some savings can accumulate from the smaller lot sizes, but the multiple uses mean that economies of scale cannot be realized. However, it is important to note that the multiple uses are a large part of the higher risk, rather than the many other aspects of New Urbanism. Additionally, because lenders and investors generally attach significant return premia to nonstandard, unique investments such as New Urban developments, investors may not be so difficult to find (Gyourko and Rybczynski 2000, 739-741).

A focus group in 2007 made up of New Urban practitioners of many varieties, including planners, architects, transportation experts, and a focus group of developers and builders reveals new perspectives on the barriers to financing New Urbanism (Planning Design Group 2007). The perception outlined above of higher risks and the necessity of high rates of return due to increased costs was not seen as significant. The authors of the report speculated that there are now more mature financial institutions that better

understand New Urban development and are less wary of it than in the past (Planning Design Group 2007, 3). It should be noted that the focus groups were conducted in Orange County, California, where financial institutions may be more likely to have seen New Urban developments because of the high levels of development in Southern California, and because of the high income of the area, which indicates that more people would be able to afford the higher prices.

Despite savings from efficient use of infrastructure, both focus groups agreed that there are additional costs of 15 to 30 percent greater than in conventional developments. These costs come from the enhanced architectural design, increased infrastructure with addition of alleyways, higher quality parks and civic services, and their subsequent maintenance. However, an additional cost factor for New Urbanism is the time and effort spent gaining approval for some of the alternative design elements, especially from public works and fire departments. Most New Urban elements still were found to contribute positively to the overall profitability of a development, and New Urban properties overall often sell for higher prices. Finally, developers showed concern that a slowing housing market with limited acreage available for development may limit opportunities and profitability of New Urbanism, because of their often higher housing prices. They called on governments to take on a more proactive role in planning and promoting New Urbanism (Planning Design Group 2007, 3, 4, 7). The higher costs and housing prices noted by these focus groups are consistent with the literature above, and still warrants focus on financing options and market trends for New Urban developments.

Lenders and developers have differing goals, which lead to dissonance in financing development projects (Burke 1995, 5-6). Developers tend to produce non-

homogenous projects that are customized to local tastes, making developments less attractive for lenders and investors. Lenders desire categories of homogenous project types because of their goal to achieve liquidity through combining financial assets and selling the repackaged instruments to investors,<sup>6</sup> and increase cost efficiency through loan standardization (Burke 1995, 5). Homogenous products, which are often single-use developments, are easier for lenders to sell on secondary markets, because real estate investment packages favor product standardization (Venner and Ecola, 2007, 20). On the other hand, developers work to create a building or development that has a unique ability to withstand economic cycles, and is customized to local tastes<sup>7</sup>. For instance, in a community with a large retirement home, a developer might adapt their project to include vertical mixed-use buildings to fit the seniors' preference for first floor retail or social services. The developers' goal of uniqueness often leads to complex parts of a project that do not easily fit into homogenous categories of single uses (Burke 1995, 6).

Additionally, one of the tenets of New Urbanism, as outlined by the Charter of the New Urbanism, is to model architecture based on the local climate, topography, history, and surrounding buildings (CNU 2011). If developers are advertising the project as New Urban, they will also likely produce a unique, non-homogenous product. The most common lending structure for TOD developers is to use one lender for construction and different product-type specific loans for permanent financing of the multiple mixed-use components (Venner and Ecola 2007, 18). This structure is more complex and requires

---

<sup>6</sup> This is also known as securitization, and promotes liquidity in the marketplace (Loutskina 2005).

<sup>7</sup> This is a concept termed "the fallacy of uniqueness" (Burke 1995, 6).

more time to organize when compared with conventional development, which puts TOD and other mixed-use, unique style developments, at a disadvantage.

Lenders and investors generally categorize each property type separately and evaluate the whole project as a weighted average of individual property types (Gyourko and Rybczynski 2000, 741). This is done because the component parts could be sold off separately if a default or foreclosure were to occur (Gyourko and Rybczynski 2000, 741). Vertical mixed uses, putting residential units on top of retail or commercial units, makes this parceling method difficult for financiers, and also increases their perceived risk because of additional costs (Venner and Ecola 2007, 18). There are different building requirements for commercial and residential uses, including column spacing, escape routes and sprinkler systems, and foundational requirements (Venner and Ecola 2007, 18). Developers may have to build duplicate heating and ventilation shafts because of potential acoustic problems with connecting office and residential uses (Venner and Ecola 2007, 18). Additionally, since each TOD or New Urban project tends to be unique, it is difficult for developers to use standard cost models that help in developing a reliable budget (Venner and Ecola 2007, 19). Although usually a diversity of product types decreases risk for an investment, in the case of mixed-use developments the opposite occurs. The mixed-use aspect of TOD and New Urban development leads to a fundamental vulnerability: if the market for any one of the product types in the mixed-use development slumps, the entire project is adversely affected (Venner and Ecola 2007, 19). This occurs because the entire project's performance often depends on all types achieving minimum rents and occupancy rates (Venner and Ecola 2007, 19). For instance, if there is a slump in the local housing market and occupancy drops, the amount

of foot traffic in the development can decrease, which subsequently decreases sales for the retail units.

The project must generate significant cash flow in the early years in order to be perceived as financially viable (Gyourko and Rybczynski 2000, 742). Unfortunately, New Urban projects usually have a mid- to long-term gestation period, which is why capital market participants often will not finance these projects (Gyourko and Rybczynski 2000, 742). Mixed-use properties can require holding for seven to ten years, compared with only five years for single use developments (Venner and Ecola 2007, 19). Carrying costs may also increase because a development requires a critical mass of housing units and 40,000 to 60,000 square feet of retail to become profitable (Venner and Ecola 2007, 19). During the climb to the critical mass, additional investment is required or the development will generate less cash flow than a conventional project (Venner and Ecola 2007, 19). Overall, investors and lenders are of the opinion that a multiple-use development can be profitable if the payback period is short enough, the land is bought at a below replacement cost, or the development is dominated by a single use that the financier is familiar with (Gyourko and Rybczynski 2000, 743). However, the burden of these requirements can be eased if developers create relationships with capital market players such as pension funds and endowments that often do not require as high, short-term returns for their real estate investments (Gyourko and Rybczynski 2000, 746). Additionally, more historical data is becoming available that will help the financial community better evaluate New Urban projects to understand their benefits and price premiums (Gyourko and Rybczynski 2000, 747).

Some strategies have been used to effectively overcome many of these financing barriers. Developers can structure their multiple uses to align with existing product categories so that lenders and investors can more easily parcel them. For instance, mixed-use properties can limit retail to less than 25 percent of overall square footage to make them comply with Fannie Mae and Freddie Mac standards for single-use loan types<sup>8</sup>. Developers can employ alternative building methods and materials that lower costs, and use advanced information management systems to increase efficiency. Developers can bring in large or experienced partners, which can lower investors perceived risk of the project. One of banks' key criteria in funding such projects is the strength of partners involved, as measured by net worth, liquidity, familiarity with mixed-use product types, and reputation in the market place. Finally, by presenting local and national market demand for TOD and New Urban development, developers can increase financiers understanding of the associated benefits and economic viability (Venner and Ecola 2007, 17, 21).

#### *Greenfield versus Infill Development*

There are differing views on the risks and economic viability of greenfield and infill development. Gyourko and Rybczynski (2000) found that New Urban greenfield projects are significantly more risky than infill development, with extra costs estimated at above 10 percent of the overall project's cost. This is due to the large infrastructure investments needed on previously undeveloped land. Additionally, it is more difficult to make retail economically viable without an established population base. It is also difficult

---

<sup>8</sup> Fannie Mae Selling Guide, published November 10, 2014: <https://www.fanniemae.com/content/guide/selling/b4/2.1/02.html#Commercial.20Space.20and.20Mixed-Use.20Allocation>

for town center retail to compete with large strip mall retail often found in suburbs. Because demand has been less well documented for New Urban developments in suburban areas, price premiums may be lower or nonexistent compared to New Urban developments within metropolitan areas. Most suburban greenfield projects require intervention from the public sector because of the high risk level associated with this type of New Urban development (Gyourko and Rybczynski 2000, 737, 740).

However, other scholars have also found barriers for infill development associated with cost and financing. There is abundant, inexpensive land on the urban fringe, and much of the additional infrastructure costs, such as new roads, schools, sewer, water, and power lines, are paid for by local governments, rather than developers (Dorsey 2003, 73). The deteriorated infrastructure, and lack of supporting facilities and services in infill development locations raises costs and creates challenges for infill development (Farris 2001, 7). Although many advocates such as Gyourko and Rybczynski cite the ability to use existing infrastructure as an advantage for infill over greenfield development, practitioners find that the infrastructure is often obsolete because of the need for upgraded facilities and additional infrastructure investment for higher density development (Farris 2001, 14). The cost of land assembly, which includes acquisition, relocation, demolition, and site preparation, in a good market location is significantly higher than suburban sites (Farris 2001, 8). A developer might pay \$0.25 to \$4 per square foot in land assembly costs for open land in a standard suburban residential site, as opposed to \$15 per square feet in a built up marginal or blighted urban environment (Farris 2001, 9). Infill projects have additional costs for determining whether contamination exists and eliminating any negative externalities because of the close

proximity to other properties and uses in the surrounding city (Farris 2001, 10). In a study evaluating over 100 sites, an average of 30 percent of total developments' costs were publicly funded for infill projects. This is because of the need for land write-down, government compensation for the difference between the market value of the land and the fair re-use value based on government restrictions placed on infill development (Farris 2001, 11). The developer also has to pay major transaction costs to gain approval for the development from existing city plans, blight designation, and condemnation processes (Farris 2001, 13). Central cities generally have more bureaucratic processes that developers must go through (Farris 2001, 19). Zoning and subdivision regulations often need reworking because they are not naturally conducive to infill development (Farris 2001, 19). Infill projects frequently occur in local and federal historic districts, which can be an asset to development, but also means the project requires highly complex review and approval processes (Farris 2001, 20). Cities also include socially advantageous programs such as provisions for minority, local, or female construction employment, which can increase costs for city developers as compared with suburban developers (Farris 2001, 19). Finally, financing is made more complex and riskier by the need to find investment by numerous public and private entities, in comparison with suburban development (Farris 2001, 22). However, the public-private partnerships can be made easier and cheaper if local governments reduce transaction costs (Farris 2001, 26).

The higher economic risk of developing commercial uses in low population densities with existing large-scale commercial competitors cited by Gyourko and Rybczynski is still a significant cost for greenfield development. The *2005 Expectations and Market Realities in Research Report* states that retail centers in infill locations are

particularly attractive because of their convenience in a growing and more geographically concentrated U.S. population (Venner and Ecola 2007, 22-23). Concerns over sprawl, traffic congestion, and the likelihood of higher energy prices is increasing the desirability and demand for more convenient urban living environments such as infill developments (Venner and Ecola 2007, 23). In his examination of financial viability of infill development, Farris did not examine the economic benefits for mixed-use development within a city.

At this point, both infill and greenfield development often need public financing to encourage private developers to take the perceived risk of a mixed-use, New Urban development. Local governments can address many of the problems related to high costs and financial barriers by simplifying bureaucratic processes around development, and paying for infrastructure. Since both types of development can provide economically, environmentally, and socially positive externalities for the community and surrounding area, governments have an incentive to lower costs for developers to take on New Urban and transit-oriented development.

#### *Fiscal Analysis of Development Scenarios*

The infill approach to New Urban development is sometimes thought to be less cost effective, but there is evidence that it can actually generate a greater net benefit for city governments than either New Urban or conventional greenfield development.

Although there is significant literature on housing premia for New Urban homes, there are few available complete fiscal analyses of New Urban developments. Additionally, it is helpful to compare these developments with traditional suburban development.

Strategic Economics performed an analysis of three developments in Nashville-Davidson County, Tennessee to determine the fiscal costs and benefits based on the impact of the developments on the General Fund (Strategic Economics 2013). The Gulch is a 76-acre infill project on a brownfield site with 4,500 housing units and six million square feet of retail and office space that incorporates aspects of New Urban design in an urban setting. Lennox Village is a 185-acre New Urban style development in a greenfield location with 1,700 residential units and 67,000 square feet of retail and office space. Bradford Hills is a 185-acre conventional suburban development with 538 housing units and 39,000 square feet of retail and office space. The County uses a tiered property tax rate and service level, which places The Gulch within the urban area that pays a higher property tax rate and receives additional services. Although additional services may impact property values, these additional taxes and services are not included in the cost analysis, as those funds are not taken out of the General Fund. The results revealed that The Gulch performed better in all cases compared to the other two greenfield development options. The infill development had lower service costs, generated more than twice as much revenue as Bradford Hills or Lennox Village, and produced the largest surplus, \$115,720, in net revenue, compared to the meager of \$100 net revenue generated by Bradford Hills, and nearly as meager \$780 produced by Lennox Village. On a per acre basis, it is clear that the New Urban style infill development is more expensive to serve compared with the New Urban or conventional greenfield development, but the expenditures are outweighed by higher per acre revenues. However, this study does not consider upfront infrastructure costs (Strategic Economics 2013, 2, 3, 10).

These contrasts point out the economic benefit for local governments to build infill developments rather than greenfield developments. The effect of higher property tax revenue and the higher value of commercial space overcame the high cost of purchasing and building on infill land. However, the authors' neglect to include upfront infrastructure costs leaves some uncertainty as to their conclusions. In some cases, greenfield sites have been shown to have higher upfront infrastructure costs because everything must be built new, but in other cases infill developments have higher costs because of brownfield clean up and demolishing and redoing existing infrastructure.

Another study that compared brownfield and greenfield developments in Baltimore, Chicago, Minneapolis, and Pittsburg included upfront infrastructure costs (Hendrickson et al. 2012). The brownfield sites were on average six times closer to the city center, had five times more households per acre, and had double the walkability index compared with the greenfield sites. The costs depended on the extent and type of contamination, and the end use of the site or desired level of remediation. Costs for both green and brownfield development include building cost, development infrastructure, and building utility and maintenance. The brownfield sites were estimated to have one percent lower annual costs compared with greenfield sites. The authors found that lower infrastructure costs, building utility and maintenance costs, and road maintenance due to lower residential travel resulted in slightly lower costs per resident than for greenfield sites (Hendrickson et al. 2012, 5-6, 12-13).

In a broader review of literature, Biddle et al. (2006) also came to the conclusion that brownfield development is less costly to local governments. They reviewed literature including a case study on the Toronto area, which showed a net benefit of \$52,629 per

hectare for a brownfield development. Additionally, for every 80 cents spent on brownfield redevelopment, between \$2.75 and \$3 of additional output is generated in the local economy. The authors conclude overall that infill development costs less than greenfield development in terms of infrastructure costs and externalities, but market forces demand that both forms of development exist, due to the continuous demand for expansion into greenfield sites (Biddle et al. 2006, 10, 11, 13). However, based on these analyses, New Urban developments on infill locations may be an easier sell to local governments due to their lower costs and higher revenues.

#### *Fiscal Analysis of New Urbanism*

The economic analysis of any planned New Urban development will undoubtedly differ because of the many varying contexts in which New Urbanism can be implemented. However, an accurate and in-depth analysis is key to the success of a project, as it will be used to apply for public and private funding, for government approval, and to convince constituents, governments, developers, or financiers that the project will be a successful investment in the community. The published fiscal analyses of various New Urban projects use similar methods on some aspects of the analysis, but vary greatly in others<sup>9</sup>. The following section synthesizes these methods into a coherent blueprint for policy makers to use in their fiscal analysis of a New Urban development.

#### *A. Revenue and Economic Impact*

In analyzing the benefits of the development, all studies included both analysis of the tax revenue generated by residential and commercial properties in the development,

---

<sup>9</sup> These studies include the City of Casselberry 2009, MDOT 2005, Strategic Economics 2013, BAE Economics 2011

and the economic impact on the community. Public officials use the analysis to determine funding and approval, and they are interested in not only revenue and profit, as a company would be, but also the net public good or bad the development has in their constituency. The economic impact is determined by analyzing job creation, which also has an effect on sales tax revenue received by the government. Finally, most studies included analysis of the one-time economic impact through job creation and government revenues during the construction period, as well as the permanent yearly impact of the development.

#### *A.1 Construction Period Impact*

To determine the direct, indirect, and induced job creation and earnings during the construction period, one study used the US BEA RIMS II multipliers (City of Casselbury 2009, 3). Much of the government revenue comes from transfer taxes and recordation fees associated with the construction (BEA Urban Economics 2011, 1). The new jobs come from construction companies, as well as from the demand of the construction workers on the surrounding community's commercial uses, which increases the need for employees.

#### *A.2 Permanent Economic Impact*

The permanent economic impact of the project is largely dependent on the permanent jobs and residents attracted by the development. The predicted population can be determined by calculating the average number of people per household for single-family and multi-family units as determined by the American Community Survey for that area (Strategic Economics 2013, 15). The predicted employee population can be determined by the number of square feet of commercial building per employee, as

determined by the American Community Survey (Strategic Economics 2013, 15). The study of developments in Nashville found these values to be 2.52 people per house for a single-family home, 1.55 people per dwelling for a multifamily residence, and one employee per 500 square feet (Strategic Economics 2013, 15). This study also determined that households spend about 30 percent of their income on retail on average, and 60 percent of their retail purchases are likely to be taxable for the County of Nashville-Davidson (Strategic Economics 2013, 19). The other 40 percent was estimated to be untaxable or spent outside of Nashville, where the development was being built (Strategic Economics 2013, 19). Any given area can use the average of 30 percent of income spent on retail, or a more educated guess using consumer data for that area, and determine what percent of that would be taxable based on studies of consumer behavior and the tax system of the area. By multiplying this percentage with average income and the estimated population, officials can predict how much annual revenue will be brought into the government via sales taxes. However, this study did not incorporate the sales tax revenue impact of the people who will work in Nashville because of this development, and make purchases during the day. To determine the increasing costs of government services from the development, these researchers weighted employees of the area as having one half the impact of a resident, since they will only be spending about half of their day there (Strategic Economics 2013, 22). This principle could be applied to sales tax by multiplying the sales tax revenue per resident by one half to get the sales tax revenue of an employee brought in by the new development. These numbers are educated estimates and assumptions, and it is important to note they are arbitrary to some extent, and may not be accurate. It may increase the accuracy of the analysis to conduct a sensitivity

analysis, where different values are used for these numbers to determine how much any one variable affects the results of the analysis. This would give policymakers an idea of what implications these many uncertainties have on the fiscal outcome of the project.

### *A.3 Property Values and Tax Revenue*

All studies determined predicted property values by making comparisons with similar homes in the real estate market surrounding the area. This was done for both commercial and residential units. In some studies, the extent of the analysis was utilizing the average property values for surrounding, similar areas. However, one study applied property values on the higher end of the averages for the area (MDOT 2005, 45).

Researchers reasoned that by the time the properties actually enter the market, prices will have risen. Additionally, as summarized previously, a large body of research concludes that properties in TOD or New Urban areas sell for a price premium. One analysis used an existing TOD community in the area as a proxy for the potential property values in the new development (City of Casselberry 2009, 2). In cities where there are existing, comparable TOD communities, this method would be a superior way to predict property values. However, in many places a TOD or New Urban community will be the first of its kind, in which case the upper end of average property values in the area would be appropriate.

Once property values have been determined, the tax revenue generated from these properties can be predicted. Property tax rates are set by the local government, and can be applied to the average property values of residential and commercial properties, and multiplied times the number of each property type. This will give the annual tax revenue brought in by the added development. One study in Seminole County, Florida used this

method and found the total revenue from property taxes would reach \$779 million by 2028, and reach \$13 million in tax revenue in that year alone (City of Casselbury 2009, 2). The City of Baltimore calculated annual fiscal revenue to the City of \$12.8 million for a development with over a million square feet of commercial uses, and 1400 dwelling units (BAE Urban Economics 2011, 5). These revenues can then be combined with the sales tax revenues to determine a total revenue number for the development. This revenue combined with construction period revenue, construction period job creation, and permanent job creation makes up the fiscal benefit to the government.

### *B. Expenditures*

Expenditures for the government do not include the construction costs, which are generally covered by the developer. The government may need to pay for infrastructure improvements and additions, and additional government services for the added population from the development. Finally, many proposals include a plea for various types of public funding in order to close the feasibility gap to allow a project to continue, which may add to government expenses should officials choose to grant funding.

#### *B.1 Infrastructure and Government Services*

Infrastructure costs taken into account by most studies were costs for new roads, utilities such as water and sewage, and demolition costs for infill development as estimated by the public entities that perform those services (MDOT 2005, 44). A study in Baltimore, Maryland estimated infrastructure costs of around \$470 million (MDOT 2005, 44). The analysis for Nashville-Davidson County incorporated the extra burden of the new population on government services, which increased the accuracy of the expenditures estimate. They determined that administrative costs would only increase by

50 percent with an increase in population, since it is a more fixed cost (Strategic Economics 2013, 22). The following services were determined to be dependent on population: law enforcement; fire department and EMS; public works; regulation, inspection, & conservation services; social and health services; libraries, recreational and cultural services (Strategic Economics 2013, 22). Because of economies of scale, the additional population would not warrant a full 100 percent increase, but rather a slightly smaller number, which the analyzers chose to be 90 percent. From the existing expenditures, these variability weights, and current population, the per capita expenditure for each of these categories can be determined, both for a resident who is weighted as 1, and for an employee, who is weighted at 0.5 because they theoretically spend only half their time in this community. The per capita expenditure for residents and employees can then be multiplied by the predicted number of employees and residents brought to the district from the new development. This number is the increase in government expenditures due to the new residents and employees.

### *B.2 Public Funding*

If the development is not able to find financing through private means, it may be necessary to present an public funding option to close this feasibility gap. One study in Baltimore, Maryland, proposed tax-increment financing (TIF). This option was analyzed using property tax rates and assessed values. The study determined that by converting the State- and Housing Authority of Baltimore City (HABC)- owned properties to developments that pay property taxes, the state could offer TIF bonds to the developer, which gives a more stable guarantee the State will be able to pay for the project. The increased assessed value from this conversion comes to over \$800 million, which the

researchers calculated as supporting more than \$175 million TIF bonds, well over the \$81 million needed to finance the project. Once the TIF bond debt service cost was deducted, the City still generated \$10 million in annual new property taxes. Such an analysis of public funding and financing options will only be necessary to include if the developer is not able to complete the project without public support. Public funding along with additional infrastructure and government services make up the government's expenditures for a development.

### *C. Accuracy of Predictions*

Peter Katz, one of the founders of New Urbanism, wrote an article for *Better Cities & Towns* that explores the issue of economic sustainability of New Urban developments from a local government standpoint (2013). Katz argues that local governments are chartered to serve the community's public good, which relies on converting land into revenue in the most efficient way while generating the greatest long-term value for the community. To determine whether a development fits this goal, communities are performing more and more fiscal impact analyses. However, often these are based on subjective criteria that can be chosen manipulatively to advance proposals for projects that actually become a drain on fiscal funds (Katz 2013). Although most projects publish proposals and economic analyses before a project is approved, very few publish the actual net fiscal impact after the development reaches full build out, making it difficult to determine how accurate the cost and revenue predictions are for New Urban developments. Katz cited two studies, one focusing on California's San Joaquin Valley and one on Rocky Mountain communities that examined the actual economic impact of

dense, mixed-use developments, which give some idea as to the fiscal impact of the average New Urban project (Katz 2013).

The first study in California focused on city and county property tax revenues in Turlock, Modesto, and Merced (California Infill Builders Association 2013, 1). By examining the actual tax revenue collected by the local governments, the authors found that mixed-use developments near city centers achieved more revenue per acre than suburban, single-use developments (California Infill Builders Association 2013, 2). The multi-story structures used land more efficiently, fitting more tax-paying property on a given acre of land, in addition to the price premium these properties often acquire (California Infill Builders Association 2013, 2). They also found that big-box-style retail development provided almost 50 percent less property tax revenue per acre on average compared to a downtown retail property (California Infill Builders Association 2013, 2). Unfortunately, this study was not a net fiscal impact analysis and focused entirely on property tax revenue without considering up-front or maintenance costs.

The Sonoran Institute (2012) examined nine communities across the Rocky Mountains and found that multi-story, mixed-use properties brought in many times more revenue per acre than other types of commercial or residential developments. The multi-story buildings had a maximum height of six stories, indicating a New Urbanism style rather than the skyscrapers of Urbanism. In Billings, Montana, mixed-use properties brought in on average \$230,000 in property tax revenue per acre, compared to only \$6,000 per acre, the average property tax revenue for K-Mart, Walmart, and Costco (Sonoran Institute 2012, 2). Additionally, the authors found that large malls and box-style retail have a shorter lifespan, and the degraded buildings are a harder sell than mixed-use

properties. It is easier to provide upkeep to downtown properties because often a larger percentage of the population can afford remodeling and rent as the property starts to degrade (Sonoran Institute 2012, 3). The study also found that large shopping centers require substantial and costly public infrastructure compared with the revenue they bring in, whereas denser developments in the urban core often require smaller infrastructure and service upgrades and expenses (Sonoran Institute 2012, 4). Overall, the study found that walkable, mixed-use developments are better for tax revenue and less expensive to maintain than suburban developments (Sonoran Institute 2012, 4).

Although these studies did not examine the actual fiscal impact compared with the predicted fiscal impact of these developments, they provide some evidence that new urban style developments often have a positive fiscal impact. Fortunately, Katz notes that due to high demand, there are emerging fiscal impact computer models that will enable this analysis to be more accurate (2013). However, the politics surrounding the decisions made with these models, such as elected officials who want to please constituents or favored developers, will persist, and such models will never be perfect (Katz 2013). As these models emerge, Katz suggests a regulatory filter based on municipal revenue return to rule out projects that will likely not cover up-front infrastructure costs within a reasonable time frame (2013).

There could be many reasons that there is a scarcity of studies revealing both a development's forecasted and actual fiscal impact. These projects often encounter unexpected changes to the timeline, which means the forecasts of net present value are no longer accurate, making a comparison of the forecast and actuality unhelpful. Similarly, projects are usually forecasted using the full build-out scenario, and political and

economic factors over time may render this scenario impossible, making a comparison between the predicted and the actual impact unproductive. Additionally, in order to calculate the actual net fiscal impact there may be so many complex variables for which data is difficult to gather that this calculation is often not performed. It could also be that because so often the projects are less economically beneficial than forecasted, developers and politicians choose not to publish the actual fiscal impacts. Flyvbjerg et al. (2009) found that large infrastructure projects often end up over budget and fail to perform up to predictions. They outlined potential reasons for the systematic optimism they found. Two main reasons were delusional optimism, which involuntarily led planners to highlight scenarios of success and overlook mistakes and miscalculations, and deception on the part of planners, politicians, or project champions in order to increase the likelihood that their project would gain approval and funding, rather than the competition's (Flyvbjerg et al. 2009, 172). It is politically advantageous to emphasize the positive effects and downplay the negative so that projects may proceed easily and quickly, and this can lead to significant exaggerations of fiscal benefit. This is potentially a barrier to New Urbanism. Since there is no strong evidence published that demonstrates the actual profitability of New Urban projects, or the likelihood that predictions of its profitability are accurate, developers, financiers, and government officials alike may be hesitant to pursue such projects.

## **Chapter 4 New Urbanism Perspectives and Contexts**

The possible development solution laid out in the previous chapter, New Urbanism including TOD, must be analyzed in order to determine its effectiveness to potential varying perspectives and contexts. This thesis defines successful urban planning as reducing vehicle miles travelled and vehicle trips, and increasing the proportion of people that take mass transit, walk, or bike to work. However, the development styles must also be analyzed in terms of feasibility considering the many contexts in different cities, and in terms of the multiple players involved in urban planning.

### **4.1 Urban Planning Perspectives**

There are multiple agencies involved in development, including many levels of government, different authorities within the government, private developers, investors and lenders, and community groups. The most important entities that are almost always involved in a development and have the most direct power over what type of development is built are the private developers and the municipal government. Although the other entities are important in the process, usually their perspective is to some extent taken into account by the private developer or the municipality. For instance, a city government generally aims to improve the public good of the community so planning officials often incorporate desires of community groups into their decisions. Private developers cannot operate effectively without investment and loans, so they tend to adjust their development plans to reflect the desires of investors and lenders.

#### *Private Developer Perspective*

Private developers primarily care about selling properties quickly, and at high prices. They are also concerned with their reputations as developers, which often ride to a

degree on the long-term success of their developments, although long-term success is often secondary to the immediate profits. Developers must also incorporate the desires of financiers into their planning, because investors and lenders often have specific product types they fund more easily and cheaply.

Overall, there are many more developers building conventional developments than are building New Urban developments (Song et al. 2009, 2). This is because developers perceive a higher risk in building New Urban projects (Gyourko and Rybczynski 2000, 737). The unique product types in New Urbanism have more difficult costs to estimate than conventional product types. The budget is therefore generally less accurate, making the project's estimated profit less accurate as well (Venner and Ecola 2007, 19). The demand for New Urban neighborhoods is not yet well documented, so developers also perceive a higher risk in selling homes, and in the price they will get for residential or commercial units (Venner and Ecola 2007, 22-23). Lenders and investors perceive a higher risk in mixed-use projects, so it is generally harder to finance them (Gyourko and Rybczynski 2000, 740). However, there is evidence of the benefits of New Urbanism in terms of price premiums that people are willing to pay for a home in a New Urban neighborhood (Tu and Eppli 1999, Song and Knapp 2003, Bartholomew and Ewing 2011). There is also increasingly documented demand for New Urban neighborhoods, and more generally mixed-use, dense, walkable neighborhoods (Ellis 2002, 271). As developers become aware of these benefits, they are more likely to enter the market of New Urban development. Additionally, public financing options and changes in regulations and incentives moving forward will push developers to build more New Urban projects.

### *Municipal Government Perspective*

Municipal government pursues goals more in line with the public good rather than economic profit. In terms of urban development, the government tends to consider the impact of the development in the community. City officials often prefer a project that has a positive economic impact on the community, such as in boosting employment or drawing in more commercial revenue. Additionally, a city government is typically interested in raising tax revenue, and may choose developments that include commercial businesses that provide more property taxes, as well as other taxes. In a different context, cities also may be less likely to approve developments that include commercial uses because they could reduce property revenue in the surrounding area. Often, heavy industrial or traditionally “ugly” commercial uses will lower property revenue, but the effect on total tax revenue for the government depends. In some cases, commercial uses such as car dealerships can bring in significant tax revenue for the government that outweighs the decreased property values and tax revenue of the surrounding homes and businesses.

Environmental sustainability is often part of the goals of a city government because of the rising number of grants and awards for sustainable cities, and the increased importance of sustainability in a city’s reputation and draw for residents and businesses. City governments also want to avoid unhappy constituents, so officials take into account negative externalities when planning development. Some negative externalities could include additional noise from commercial activities in a mixed-use neighborhood, increased traffic from commercial and retail uses, or blocked views from taller buildings. Often the government is also more interested in equity in the distribution

of benefits from the development. For instance, governments may pursue planning that incorporates affordable housing and even affordable retail to ensure low-income residents benefit from the development. Municipal planners may not want to pursue a development that causes significant gentrification, which can produce unhappy residents and a negative reputation for the city government as not caring about low-income or minority residents. However, local governments are also interested in maintaining high property values, and an image of their community that may not include lower income minorities or aspects such as public transportation that could bring a different population through their community. For instance, Eric Berkowitz outlined the arguably NIMBYist actions of the congressman representing Beverly Hills in the *LA Weekly* (August 18, 2005). The “subway to the sea” was originally planned to go through the wealthy city of Beverly Hills, but local officials fought the development because the community did not like the changes it would have on the area (Berkowitz 2005). Ted Chen and Irene Moore (May 21, 2014) wrote that residents are still fighting the extension of the line as it is now routed to go underneath Beverly Hills High School (Chen and Moore, 2014). However, recently there has been more support for public transit construction. Studies have shown significant increases in property value once construction is complete because of the increased access for the neighborhood to the CBD (Bowes and Ihlandfeldt 2001, 21). Finally, the city government promotes safety in the community. Officials may dislike developments that lead to a higher volume or speed of traffic, or produce locations that inadvertently lead to criminal activity, such as alleyways and other hard-to-see areas.

There are many aspects of New Urbanism that would push municipal governments to be in favor of it, especially compared to conventional sprawl. The

economic stimulus of incorporating mixed use, commercial areas, the reputational benefit of environmental sustainability of the design, and the increased safety from features that increase visibility are examples of design elements that forward municipal government goals. However, there are significant risks of gentrification, negative externalities from commercial uses, and possible traffic congestion if design elements do not decrease car use sufficiently. The government is responsive to public opinion, so their desire for New Urban development also depends significantly on the local demand, and other contextual factors.

#### **4.2 Restricting Contextual Factors**

Development types are not often one size fits all, and New Urbanism may not be as successful in all contexts when compared with alternative development types. Cities across the United States vary drastically in many contextual factors, and even within those cities, neighborhoods have varying contexts that affect the appropriate development style. When analyzing New Urbanism as a development solution to reducing carbon footprints, it is important to consider physical, political, cultural, and economic contextual factors that affect its feasibility.

##### *Scale of Development*

New Urbanism is mostly focused on neighborhood development. The tenets laid out in the Charter for the New Urbanism are mostly neighborhood-level design features. The average neighborhood that has been characterized as New Urban by *New Urban News* is around 867 units (Song et al. 2009, 2). Because of the relatively small scale of New Urban developments, New Urbanism may not be effective in a place where larger scale development is preferred. Additionally, while New Urbanism does have higher

density standards than most conventional development types, in large city centers such as New York, densities are even higher and New Urbanism may not be as appropriate as simply urban development. The goal of reducing VMT and number of car trips may be achieved more effectively in a big city center by building high rises in the existing pattern of the area, rather than the generally lower density building in New Urbanism.

Additionally, focusing the development around a central square with public spaces or civic buildings may not be possible in a dense urban setting with limited space.

### *Transit Infrastructure*

Many design features of New Urbanism contribute to a pedestrian- and transit-oriented development. These features include narrow streets, public and residential parking in the backs of residential and commercial units, short blocks, and pedestrian priority features. These elements intend to decrease car use by making it less attractive and convenient to drive. However, an area in close proximity to a highway system that does not have convenient public transit nearby may not actually see a reduction in driving. The commercial features of New Urbanism are not intended to be large companies or organizations that employ many people. Subsequently, residents of New Urban neighborhoods often must commute to work outside the neighborhood. Most commuters will still use cars if they are the most convenient option, as is the case in many sprawl cities. In this case, the pedestrian-oriented features of the neighborhood may actually make for a more dangerous environment for pedestrians. A more conventional development style may be more conducive to areas with inevitably high car use. Although in the very long-term even sprawl cities will hopefully develop viable, far-reaching public transit, currently there are many settings in which auto-centric regions

inhibit the viability of New Urbanism. However, there are examples of corporations providing a solution to this problem through shuttle services for their employees. As laid out by Queena Kim in *MarketPlace* (December 26, 2012), the most prominent example of private shuttle services is the phenomenon of technology firms based in Silicon Valley, such as Google and Facebook, which have private buses for their employees that run from San Francisco and other parts of the Bay Area to the companies' locations in San Jose and Palo Alto. These could serve as temporary fixes for the lack of transit in more sprawling cities, but New Urbanism flourishes to a greater extent when connected to a regional transit system that allows residents access to many places in the area without a car.

#### *Local Politics and Culture*

Because they are unconventional types of development, New Urbanism and TOD can be unpopular in many communities. Cervero found that many residential, economic, and mixed-use developments planned around transit stops in the San Francisco Bay Area were halted by opposition from community groups (Cervero 1997). However, it is important to note that the resistance usually stemmed from the fear that the higher density will be disruptive, rather than opposition of the New Urbanism planning style as a whole. This opposition usually stemmed from the additional noise, higher density, residential and commercial growth, and the perception of increased traffic from growth (Cervero 1997). Often opposition to New Urbanism occurs in traditional suburban areas with lower densities and strictly segregated uses. Residents find that the alternative style of development does not match the surrounding area and may be a disruption to the flow of automobiles because of the traffic-slowing, pedestrian-oriented design features.

Unpopularity among the local population can lead to local government officials disapproving of the project as they strive for re-election. Without the support of the community, or of local government, New Urbanism initiatives may not be feasible.

### *Local Planning Policies*

Policies are often slow to respond to changes in demand and culture, so planning laws can be an obstacle to non-conventional development. Existing zoning policies often segregate single uses, making the mixed-use aspect of New Urbanism and TOD impossible. Additionally, in areas of conventional development, zoning laws can prohibit high densities of residences and businesses. Planning policies also often require significant auto-centric infrastructure, such as wide streets and parking that make New Urban elements encouraging walking, biking, and public transit impossible. Cervero (1997, 310) found that new zoning policies were necessary for the success of several transit-oriented developments in the San Francisco Bay Area. The new policies increased the allowable floor area ratios<sup>10</sup> within 700 feet of stations, and allowed for higher densities for buildings adjacent to downtown BART stations. Without these revisions of the zoning laws, much of the TOD around BART stations could not have occurred. Planning policies can be changed, but the slow speed of local government can be restrictive to development projects that require a faster timeline.

### *Crime*

Jane Jacobs (1961) first popularized the idea that neighborhoods that get “eyes on the street” have reduced crime. This is primarily achieved by designing for visible public

---

<sup>10</sup> The floor area ratio is the ratio of the gross floor area to the area of the plot of land. Increasing this allowable ratio means that buildings can be more stories.

spaces, homes with front porches, and constant street activity to attract the attention of residents (Jacobs 1961, 276). New Urbanism draws residents to look outside through mixed uses that invite street activity throughout the day and evening. Additionally, New Urban residences often have front porches, and visible public squares and parks are key elements of the design (Bohl 2000, 787). However, New Urban developments also often include alleyways so that cars can use rear parking and stay out of sight, leaving the main street network for pedestrians (Bohl 2000, 787). This can be a spot for criminal activity because of the low visibility. In an area with higher crime rates, the New Urban design may create more locations for criminal activity near residences.

#### *Financing from the Municipality*

As outlined in Chapter 3, developers often have difficulty finding investors willing to lend money for unconventional New Urban and transit-oriented projects. Often tax-exempt financing from the local government is necessary for a developer to economically justify proceeding with the project. For example, the Pleasant Hill BART station received tax-exempt financing that underwrote the costs for assembling the land for the transit-oriented development. The municipality paid for ten of the 14 million dollars in infrastructure improvements through tax exempt financing. The City of Oakland also underwrote many of the development costs around the downtown Oakland station. The City's redevelopment authority provided assistance with land assemblage as well, provided tax increment financing of public infrastructure<sup>11</sup>, and secured federal

---

<sup>11</sup> Tax increment financing is a method which uses future gains in taxes to subsidize current improvements, based on the assumption that they create the conditions for gains above the routine yearly increases which would occur without the improvements

urban renewal grants for the project (Cervero 1997, 326, 328). Where the municipality is unable or unwilling to provide some financing, developers may not be able to proceed with a New Urban development.

### *Local Economy*

New Urbanism tends to attract small “mom-and-pop” businesses because mixed-use zoning and small lot sizes make large businesses and chain retail impractical. Economic revitalization tends to come from the introduction of larger businesses that employ more of the population and attract more consumers to the neighborhood (Bohl 2000, 792). In many cases, significant economic growth will not occur from New Urbanism’s small businesses (Bohl 2000, 792). Municipalities seeking to revitalize an area may choose a more conventional development with larger businesses when attempting to revitalize a depressed area. However, some scholars argue that small businesses are vital for revitalization because they are more likely to care about the neighborhood in addition to profits (Delgado 1997, 449). Small businesses are often considered to be intrinsic to a community’s economy because they are more willing to adapt to local conditions, and less likely to move out of the community when facing economic challenges (Armington and Odle 1982, 17). Especially in ethnic neighborhoods, locally-owned small businesses can provide a venue for public information and social services to enhance the quality of life for residents (Delgado 1997, 450). Although many New Urbanists state that New Urbanism design alone cannot solve a neighborhood’s economic depression, tools of the design can help meet economic development goals, depending on the context (Larsen 2005, 811).

Gentrification is another important challenge in building New Urban projects in low-income areas (Bohl 2000, 793). Even when developers and government officials work pointedly to avoid gentrification while revitalizing a neighborhood, often low-income residents are still forced out by the rise in housing prices and wealthier newcomers (Larsen 2005, 811). Often city governments will try to avoid gentrifying projects because of their unpopularity among constituents who fear being displaced, but the popularity of economic revitalization among the rest of the population can overpower the low-income voices. However, there are cases where New Urbanism has been incorporated fairly successfully into affordable housing projects, such as the HOPE VI projects, which is one way municipalities can use New Urbanism to raise the quality of life in low-income areas (Bohl 2000, 764).

On the other hand, studies have shown that consumers are willing to pay a price premium for homes in New Urban and transit-oriented neighborhoods (Bartholomew and Ewing 2011, Song and Knapp 2003, Tu and Eppli 1999, Bowes and Ihlanfeldt 2001). The businesses in New Urban developments tend to be more expensive to reflect the population's higher income, which is required by the higher housing prices. As summarized in Chapter 3, developers are pressured to sell properties quickly and at high prices. They face higher risks in low-income areas where the population is less able to afford the properties, and shop at the businesses. A developer will likely want to build New Urban and transit-oriented developments in areas that already have higher average incomes to lower the risk of the development.

### *Greenfield and Infill Sites*

There are drawbacks for both greenfield and infill sites, as summarized in Chapter 3. The small New Urban businesses in greenfield sites may have difficulty competing with strip centers found in the surrounding suburbs (Gyourko and Rybczynski 2000, 737). Greenfield sites also present a challenge for businesses of surviving without an established population base (Gyourko and Rybczynski 2000, 737). On the other hand, infill developments are within municipalities and are often subject to more complicated regulations and zoning policies (Farris 2001, 19). In addition, the demolition of existing structures and outdated infrastructure can be costly and cause negative externalities such as dust, smoke, and noise for the surrounding city.

Municipalities and developers have differing goals that may lead to diverging preferences for greenfield or infill development. Local governments often want to improve the quality of life in a troubled community within the city, leading to a preference for infill development to stimulate revitalization. Additionally, municipalities may have to pay more to expand infrastructure into a greenfield development than they would have to improve the infrastructure in an infill development (Gyourko and Rybczynski 2000, 737). Infill projects also give the city more jurisdiction to require developers to employ local, minority, or female workers to further revitalization efforts (Farris 2001, 19). New Urban and transit-oriented developments can be publicized by the city as being environmentally friendly and improve the city's reputation. There are grants available from non-profit and governmental organizations for sustainable cities that include parameters like transit- and pedestrian-oriented uses. On the other hand, the higher population density surrounding the project means the city government may face

more criticism for the negative externalities. Additionally, there is more of a possibility that other interests may have wanted the site for other projects, making the project potentially politically disadvantageous.

The developer does not have as high of stakes in the long-term success of the economy of the area, or in the businesses themselves once they sell the properties. Developers tend to choose the cheaper option that will sell properties faster. Often land assembly costs more in infill developments, leading developers to choose to build on greenfield land on the outskirts (Farris 2001, 9). Transaction costs for gaining approval for projects are often higher in infill areas as well (Farris 2001, 13). However, it can be more difficult to sell commercial properties in the suburbs where there is a smaller population.

Both greenfield and infill development have drawbacks and benefits for both developers and municipalities. The relative advantage of one development site over the other will depend significantly on the local context. Because infill developments do not take up more land, are more likely to be accessible by transit, and do not contribute to the sprawl effect in cities, they are more likely to have a greater effect on reducing vehicle miles and car use. Greenfield locations may be a less effective choice in accomplishing this goal because of the increased likelihood of the need for residents to use cars.

#### **4.3 Enabling Contextual Factors**

In addition to understanding some characteristics that can restrict the ability of a New Urban development to be successful, it is helpful to identify factors of a location that may make New Urbanism easier to accomplish, and have a more positive effect. These characteristics are more difficult to identify because the New Urban development

style is fairly flexible. There are many different locations where officials have adapted the doctrine to their specific context or to address their specific goals. However, there are some factors that make New Urbanism particularly successful, both financially and in achieving social goals of a city.

### *Large Outdoor Space*

Although parks can be beneficial for a community, large parks without sufficient pedestrian infrastructure can often have limited foot traffic, creating a barrier between parts of a city, and contributing to sprawl and car use. New Urbanists in the past have transformed large outdoor spaces into smaller urban public spaces with New Urban elements to create more walkable, attractive community features (Bohl 2000, 767). They serve as a potential alternative to greenfield development, which is often more expensive, and less environmentally friendly compared to infill development. This type of infill site likely does not require high remediation costs, as many brownfield sites within a city do. Additionally, New Urbanism often does not have as positive of an effect when built on the fringe. Diggs Town in Virginia was rebuilt as a New Urban community with significant physical improvements, but its isolation from the rest of Norfolk, Virginia by a river meant the town still did not attract new residents or businesses (Bohl 2000, 771). Infill development is more successful, but there is limited infill land open for development, especially in cities with growth boundaries (Farris 2001, 6). A large outdoor space within a city presents an opportunity for New Urbanism to increase walkability in an area, while not facing the financial problems of connecting the development from the fringe to the municipality.

*Area in Need of Moderate Revitalization*

As outlined previously, New Urbanism itself does not necessarily provide a boost to the local economy. However, it has been used as a centerpiece to revitalization in areas that are facing some population or economic decline. Milwaukee planners used New Urbanism to attract homeowners and employers back downtown from the suburbs (Kenny and Zimmerman 2003, 75). The planners focused on the cultural value of the town in order to attract back economic wealth, especially the creative class (Kenny and Zimmerman 2003, 75). Two neighborhoods in Orlando, Florida also had success using New Urbanism to revitalize inner-city, historic areas (Larsen 2005, 810). However, consistent with previous findings, the more economically distressed neighborhood, Parramore, had a harder time using just New Urban design to reduce poverty, crime, and other negative economic factors (Larsen 2005, 811). The planning strategy was successful in realizing neighborhood economic revitalization goals in Eola, which was in less economic distress and had a higher average income (Larsen 2005, 811). Other examples of areas where New Urbanism has been used to spur economic revitalization include neighborhoods in inner-city Pittsburg, most notably Crawford Square, Louisville Kentucky, Chattanooga, Tennessee, and San Francisco, California (Bohl 200, 772-774). It has, however, been pointed out that revitalization can also lead to gentrification (Larsen 2005, 798). Recognizing this possibility and taking steps to limit the occurrence of gentrification is vital in the process of revitalizing a neighborhood (Larsen 2005, 798). New Urbanism advocates for community engagement, economic opportunity for local businesses, and diverse types and costs of housing, which, when incorporated into a design, help to reduce gentrification effects (Larsen 2005, 298).

### *Historical Patterns of Development*

Inner-city neighborhoods, especially in the eastern part of the United States, often were originally developed with many features akin to New Urban design. Some features that are more common in the older residential parts of cities include small lots, walkable blocks, homes close to the street, grid pattern, and even mixed uses (Bohl 2000, 776). Louisville, Kentucky; Chattanooga, Tennessee; and Winterpark, Florida are examples of cities that adopted New Urban design because of its compatibility with the historic pattern of development (Bohl 2000, 776). In these types of cities, suburban development had been implemented later, by combining lots or removing economic uses from residential neighborhoods, but the initial infrastructure is still in place. Planners have an easier time adjusting the street, water, waste, and even building infrastructure in areas that historically had New Urban design features. Additionally, officials might face less political resistance by framing the development as historically restorative.

### *Historical Restoration*

Along similar lines, cities that are interested in preserving historical buildings and districts are convenient settings for New Urbanism. New Urbanism often incorporates traditional architecture into a design, so it can be harnessed to achieve the goal of historical preservation or restoration. The Cotton District in Starkville, Mississippi preserved traditional architecture using a New Urban design (Bohl 2000, 775). Additionally, there are often funds for historical preservation, such as from local historical societies or museums, which could be utilized to finance New Urban projects, reducing the economic burden and potential difficulty in finding investors and loans.

### *Connection to Transit*

In order for New Urbanism to help reduce vehicle miles, the community must be either near the central business district of the city, or be connected the transit system. New Urban neighborhoods that are not connected to transit are still often financially successful, with Seaside and Celebration in Florida being prominent examples. However, many argue these communities do not achieve the environmental goals of New Urbanism, to reduce vehicle miles and the communities' carbon footprint. Many studies reveal that communities near transit stops sell for more, and more quickly, which can help the economic viability of a New Urban neighborhood (Hess and Almeida 2007, Landis et al. 1994). Some of the best examples of New Urbanism are surrounding or adjacent to transit stops, because they are often financially successful, and also do better about incorporating a mix of incomes, a mix of successful commercial uses, and end up reducing vehicles miles more significantly. These include the Fruitvale Transit Village mentioned previously, as well as Pleasant Hill Station and The Crossings, both also Bay Area developments near either BART or CalTrain commuter stations (USDOT 2011; Cervero and Landis 1997, 326-7; Bohl 2000, 775).

### *State and Local Growth Policies*

According to a study conducted in 2004, three quarters of New Urban projects were located in states promoting smart growth policies, and over a quarter were in cities that have an urban growth limit (Garde 2004, 160). As early as 2002, over 15 states were significantly reforming regulation to encourage smart growth, and 12 had already taken major steps in reforming their statewide planning and land use laws (APA 2002, 6-7). Although it is possible to build New Urban communities in states and cities without smart

growth policies or New Urban-friendly land use regulations, it is even easier to do so where helpful policies are already in place. Additionally, because these cities and states have already gone through the process of enabling a large portion of the existing New Urban communities, they are more likely to have a smooth process of approval, and potentially better chances for financing and tax breaks.

### *Ecologically Sensitive Areas*

While governments often try to preserve ecologically sensitive areas by restricting development completely, this is sometimes impractical due to limited land resources and development pressures. For instance, communities in major drainage basins must adopt plans to achieve mandated reduction in nutrient inputs. The Lake Tahoe area, Chesapeake Bay, and the Neuse River in North Carolina are examples of areas in drainage basins that use New Urban design to manage their impact on their ecologically sensitive habitats. Conventional development creates more impervious surfaces that generate more runoff, such as large parking lots, longer roads and driveways. One study estimated that more compact development such as New Urbanism could reduce a site's imperviousness by 10 to 50 percent. A study of Charleston, South Carolina's harbor area estimated that for the same amount of development, conventional sites generated 43 percent more runoff, three times as much sediment, and higher loading of nitrogen and phosphorous than the New Urban design. However, there is some evidence that New Urban developments are more successful in protecting sensitive areas and open space in greenfields, but not as successfully in infill development. This is likely because the infill areas have already been built up so there is little New Urban design can do to restore the habitats (Berke et al. 2003, 397-399, 404). Greenfield development is still occurring because of population

demands and limited land resources within cities. In cities that are adopting significant greenfield expansion, New Urbanism could be used to mitigate the effects the development might have on ecologically sensitive habitats. It may be easier for New Urbanism advocates to secure funds and approval for developing since they are likely to be more protective of the natural environment than conventional development.

## **Chapter 5 Measures to Enable New Urbanism**

Although there are situations in which New Urbanism is not a feasible strategy, many of the challenges outlined in Chapter 3 can be addressed by changing regulations and incentives, and through strategic enactment. Previous chapters have examined New Urbanism as a solution for the rising carbon footprint of urban citizens by reducing vehicle miles and increasing use of non-auto transportation. However, there are many barriers for the planning doctrine in economic feasibility, financing, political viability, and zoning laws. In order to make New Urbanism a widespread method for city planners, a more welcoming financial, political, and cultural environment must be encouraged. Innovative enactment strategies, as well as changes in the regulations and policies at all levels of government, are necessary to create settings for New Urbanism to thrive. Adjustments can be made to tax and policy incentives, local zoning policy, government financing, the regional transportation system, advertisement of the new planning doctrine, context consideration, and forming coalitions of interests in order to create a friendlier environment for the New Urbanism planning doctrine to spread throughout cities.

### **5.1 Changes of Rules and Regulations**

#### *Tax Incentives*

Because of the large cost of developments, developers tend to respond positively to tax incentives from all levels of government. Municipalities can give tax breaks for developments that incorporate various features of New Urbanism, especially those that achieve some of the city's goals as well. As an example, a tax break for pedestrian- and bike-friendly street design, such as wide sidewalks, bike lanes, and traffic-calming measures, has been shown to increase economic activity around commercial properties,

and also to reduce car accidents (ARUP 2013, 14; Rudy Bruner Award 2005, 105). The foregone tax revenue from the development is made up for by the reduced costs that the municipality would otherwise have to pay, and by the increased property tax revenue of New Urban developments. Although New Urbanism is more effective when all or most of its features are incorporated into a development, many of the features can also stand on their own to encourage walk- and bike-ability, which both reduces vehicle miles and increases property values. Thus, a tax break on developments that incorporate such features can be a strong incentive for developers to begin shifting toward New Urban style developments. State and Federal governments bear more healthcare costs, which would be reduced by features of New Urbanism such as traffic calming and walk- and bike-ability. Tax incentives for such features makes financing the development somewhat easier for developers, as they would face lower costs, and support from the government could cause investors to see the development as less risky. If all levels of government implement tax incentives that reduce costs of New Urban development compared with traditional development, developers would be more likely to pursue New Urbanism.

Another way governments have been able to promote New Urban development is by helping to defray some of the costs for infrastructure improvements, one of the most costly aspects of development. This includes infrastructure such as water, waste, electrical utility, and roads and transportation, all of which must be improved upon with denser housing and commercial uses. Since New Urbanism and TOD are often built where lower densities previously existed, significant expansion of infrastructure can be necessary, for either greenfield or infill development. The investment required by New Urban greenfield projects can have extra costs of 10 percent above standard suburban

developments (Gyourko and Rybczynski 2000, 740). Developers of infill sites have often reported that existing infrastructure is obsolete, and significant upgrades and additions for high-density building are necessary (Farris 2001, 14). Many successful projects occur because of a proactive redevelopment authority within the government who invests in public infrastructure to enable high-density development. The Pleasant Hill BART station development is one of the best examples of suburban TOD, and it was made possible by the municipal government underwriting ten of the 14 million dollars required for infrastructure improvements (Cervero 1997, 328). Since most of the infrastructure is a public good, and the city benefits from New Urban development because of the lower long-run costs from health and safety and higher property values, the local government and the developer would benefit from working together to pay for infrastructure improvements and expansions. Unfortunately, there may be limited knowledge on the part of city officials that a strategy of tax incentives and underwriting infrastructure improvements actually benefits the city. In order to convince city leaders to adopt these measures, proponents of New Urbanism should demonstrate how strategies such as these have already worked in practice, and how the increase in property values offsets the tax incentives while boosting the city's reputation. City planners must be presented with a long-term strategic plan to reveal the benefits of pursuing this strategy, or the follies of neglecting to. Officials likely will only be interested in such a plan if they are given a time frame that extends to the period when the costs will be recouped.

### *Zoning Policy*

One of the largest barriers to New Urbanism and TOD is a city's zoning code. Much of the zoning in American cities was written after federal legislation in the 1950s

encouraged suburban-style development. Consequently, many zoning codes have requirements catered to car use and low-density development. These requirements result in increased car use and low-density development, opposing the goals of New Urbanism and TOD. Local governments can revise their zoning codes to be friendly to alternative forms of development. Some of the most important changes to be made to local zoning codes include: more mixed-use zones, increased density caps, increased allowable floor area ratio, reduced required street width, bike lane requirements, increased sidewalk width, and more limited parking availability. Most of these requirements are under the prerogative of local government. However, sidewalk and street width generally are implemented by developers that build new streets and sidewalks, since it is unlikely cities will change already existing streets and sidewalks. It is much easier for local governments to simply require developers to increase sidewalk width and decrease street width, and require that the developers pay for it, rather than incurring the cost themselves as with the other zoning changes.

Parking requirements are especially troublesome for New Urban development because of their double-edged sword for low density. Often, new businesses are required to provide a large amount of parking spots per square foot, even when much of the existing parking sits unused during peak hours (Speck 2012, 120). Parking takes up a lot of space with concrete, spreads out the development, and also encourages car use. As long as it is easy for cars to access an area, streets will need to be wide enough to accommodate them, and the retail and commercial uses made for pedestrians will not be as successful. There is some evidence that reducing parking capacity may actually increase revenue. One study that compared Pasadena and Westwood, two communities in

Los Angeles, as they evolved their parking price structure showed that reducing parking capacity in walkable areas actually increased revenue for businesses, since it makes for more pleasant and easier access to stores (Douglas and Shoup 2003). Additionally, the on-street parking that cannot be avoided<sup>12</sup> should often be priced much higher than it is, to reflect the true cost of parking, and to push cars into off-street parking (Speck 2012, 130). However, this strategy is only beneficial if there is ample off-street parking that sits unused, even during peak hours. Requiring parking structures for commercial areas can help with this by attracting cars to the garage rather than the main thoroughfare. Cheap on-street parking leads to vehicles circling to find a spot rather than using the off-street lots, which increases congestion, and makes for a less pleasant atmosphere for pedestrians and bikers (Speck 2012, 129). Without changes to these requirements, neighborhoods will continue to attract a high volume of car traffic, and be unpleasant for pedestrians. New Urbanism is thus dependent on reduced parking requirements, and removing other sprawl-encouraging zoning policies. In order to convince governments to adopt these changes in zoning and pricing, New Urbanism proponents can show the beneficial effects found in existing studies, and run fiscal impact analyses on the policy changes.

Permitting higher density is another element that city governments may be reluctant to pass because of the increase in property values that can occur for more spread-out homes. However, apartments in dense settings often sell for more per square

---

<sup>12</sup> On-street parking actually should not be avoided, as it provides a buffer zone between pedestrians and moving traffic, creating a safer, less noisy public space for pedestrians (Institution of Transportation Engineers 2010, 5). However, pricing it appropriately is still necessary to discourage driving, especially on main thoroughfares.

foot than those in less dense areas (Cervero and Duncan 2002, 16). Raising density caps also saves development from expanding out, which, according to one study, can save 20 to 45 percent of land resources, 15 to 25 percent of local road costs, and 7 to 15 percent of water and drains cost (Burchell et al. 1992). Additionally, higher density caps allow the government to accrue more property tax revenue because of the added properties that can fit on a parcel of land. Often, high-density areas attract commercial uses, which tend to pay higher property taxes than residential uses, and can provide an economic boost to the area in terms of property values. However, city officials may need to be convinced of these effects. A survey of city residents' preferences for what type of area they want to live in, including density, could help prove to officials that higher density caps would be beneficial. Additionally, proponents of this change in zoning could conduct a cost analysis to predict how much money the city could save by increasing densities rather than undertaking greenfield construction.

#### *State and Federal Zoning and Tax Policy*

Although the majority of zoning laws are determined and enacted at the local level, state and federal government zoning policy can also be adapted to reduce barriers and place incentives for New Urban-style development. Local governments do not generally have the power to enact zoning laws without approval from the state government (Lamer 2003, 1). Most states allow municipal home rule, which gives local government most of the authority over zoning, but usually with some restrictions (Lamer 2003, 1). Whether the power over zoning codes and regulations resides with the state or municipality varies widely across the states, so many of the following solutions are designated as being accomplished by either entity.

Some American cities and states have adopted “form-based zoning codes” as one potential way to eliminate zoning that excludes New Urban developments. This type of code creates zone based on physical form rather than land uses. The code serves to address the relationships between buildings and public space, other buildings in relation to one another, and style of streets (Sitkowski and Ohm 2006, 164). For instance, the physical form of zones closer to the center of the city would include smaller units, street widths, and lot area requirements (Talen 2013, 190). This type of code also allows for a small number of zones, and many zones are designated as restricted, limited, and open, which are open to more interpretation as to allowable uses (Talen 2013, 190). Within this code, cities could enact a number of requirements for different zones that create more walkable communities, such as limiting parking requirements, requiring connectivity, and requiring narrower streets and wider sidewalks (Talen 2013, 192). Cities sometimes face opposition to form-based codes because developers may see it as a method of downsizing, property owners may fear tax increases and increased density, and architects and planners may view it as too creatively constraining (Talen 2013, 195). These complaints may be somewhat assuaged when more examples of codes are published that are implemented with positive effects on the community. As of 2013, there were just over 200 form-based codes enacted in cities, and 126 in development (Talen 2013, 193). Codes at the regional, county, and state levels tend to be overlay codes, which is still an important step, but higher-level governments could also step forward with form-based code requirements for local governments (Talen 2013, 194). Many state officials argue they face legal difficulties allowing municipalities to adopt form-based codes due to the fact that their zoning code is rooted in the Federal 1926 Standard State Zoning Enabling

Act (Sitkowski and Ohm 2006, 166). This act actually has provisions that balance use and form. It states:

The legislative body of cities and incorporated villages is hereby empowered to regulate and restrict the height, number of stories and size of buildings and other structures, the percentage of lot that may be occupied, the size of yards, courts, and other open spaces, the density of population, and the location and use of buildings, structures, and land for trade, industry, residence, or other purposes (Advisory Committee on Zoning 1926, 4-5).

Since the code does not give preference for use- over form-based zoning codes, state and local government could legally move forward with form-based codes to promote New Urban style developments.

Another more common solution that states and municipalities alike have adopted is creating a Planned Unit Development classification to make spaces where developers can mix certain types of land uses, subject to approval by a local planning commission (Lamer 2003, 9). PUD is not usually attributed to an area before a development is proposed, which means the developer must prepare a proposal to gain approval. The process of approval can be lengthy, which is a large cost for developers since investors are sensitive to project timelines (Lamer 2003, 9). Instead, state and local policies can implement smaller changes to zoning, such as allowing the live-work unit, a home office or apartment above a store; and the granny flat, a second building behind the main house to be used as an apartment (Lamer 2003, 9). States and cities could also implement larger, more beneficial changes such as a New Urban/Traditional Neighborhood Development ordinance that zones for mixed-use communities and maintains the same time frame of approval as other zone types (Lamer 2003, 9). One downside is that these ordinances can create New Urban islands surrounded by suburbs (Lewyn 2006, 268). Pennsylvania,

Connecticut, and Wisconsin already explicitly allow governments to promulgate New Urban style regulations and ordinances (Sitkowski and Ohm 2006, 165). This explicit approval is often necessary at the state level in order to prompt local government to enact regulations that promote New Urban forms of development (Sitkowski and Ohm 2006, 165).

Many scholars attribute large-scale suburbanization to federal zoning and housing policies in the 1950s, a number of which have not been revised (Browner 2014; Southworth and Ben-Joseph 1995; Whittlemore 2013). HUD still tends to provide grants to cities to extend infrastructure such as water and sewer lines into fringe areas, making greenfield development cheaper (Lamer 2003, 5). Federal tax policies favor home ownership by allowing interest on home mortgage and property taxes to be tax deductible (Lamer 2003, 5). Additionally, the profit made on the sale of a house may be exempt from capital gains taxation (Voith 1999, 3). These deductibles lower the after-tax housing costs of owning a home, increasing the demand for housing, and especially for larger houses, because they are made affordable for a larger range of incomes (Voith 1999, 7). Additionally, marginal tax rates generally increase with income, so the value of deductions from housing-related taxes will be larger for higher-income households, who tend to buy larger homes (Voith 1999, 8). Similarly, larger houses tend to have larger mortgages and property taxes, so these properties experience a larger after-tax housing price decrease from these policies (Voith 1999, 8). There are varied estimates on the extent to which these tax breaks are capitalized into the price of the homes, but studies generally estimate the capitalization to be around 20 percent (Voith 1999, 7). Voith estimated that mortgage interest and property tax deduction lowers the after-tax cost of

residential housing by about 15 percent (Voith 1999, 12). Voith also asserts that this reduction in turn reduces residential density by 15 percent (Voith 1999, 13). This estimate did not take into account the possible capitalization of the deductions, or the context of each community's zoning policy; however, it is clear in that these federal tax policies contribute to reduced density to some extent. By simply eliminating or drastically reducing the deductibles, the Federal government could have a positive impact on the demand and economic feasibility of denser housing.

## **5.2 Enactment Strategy**

### *Financing from All Levels of Government*

One of the most significant aspects of a successful enactment strategy for New Urbanism and TOD is incorporating all levels of government throughout the process. Many local-level governments have been involved in financing New Urban projects, but state and national governments have stayed out of the process, despite their many agencies and initiatives in development and urban planning. Often capital market participants will not finance New Urban projects because they generally have a mid- or long-term gestation period, and do not generate enough revenue in the early years (Gyourko and Rybczynski 2000, 742). Developers would be more likely to start New Urban projects if there were alternative financing options available that did not require as quick of returns. A fund could be set up in a similar format to the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). ISTEA appropriates capital on an annual basis for public transportation projects, and for mass transportation research, development, and technology transfer activities (APTA 1998, 1 & 6). ISTEA funds come from general revenues and from the Mass Transit Account of the Highway Trust Fund

(APTA 1998, 1). A government agency may submit a grant application to the fund, and the state or local government must also pay matching funds for what they receive from the federal government (APTA 1998, 1). The funding is based on a series of requirements, such as the number of bus passenger miles traveled, the number of miles per dollar of operating cost, and the urbanized area population density (APTA 1998, 1). A similar fund could be set up for New Urban and TOD projects, with a different formula to determine funding. The formula could include population density, predicted revenue and increased property values, environmental sustainability, and predicted increase in regional transport ridership. The fund could fall under the jurisdiction of HUD, and the grant money could come from many different departments that benefit from New Urbanism's effect on American communities, such as HUD, EPA, the Department of Health, or the Highway Trust Fund (parallel to the use of the trust fund through ISTEA provisions).

#### *Regional Transportation System*

One of the main reasons that New Urbanism fails to reduce vehicle miles is that planners often incorporate the doctrine in an isolated development, which not only attracts fewer residents, but also leaves residents far from where they work or spend leisure time. Creating a walkable island in the middle of a sea of suburbs usually does not reduce car dependency (Meredith 2003). Many studies have found that the quality of the pedestrian environment and level of mobility by public transportation at the destination is significant in a person's choice to use non-auto transportation (Handy 1996, 144; Hollie 2003, 426). Most people work outside of their residential neighborhood, so if there is no regional transportation system, or walkable neighborhoods at other destinations in the

city, people will still need a car. Developers that are building up New Urban areas would benefit from pressuring the city to improve public transit, bike, and walk infrastructure throughout the city, and to reduce funds to auto infrastructure. The full benefits to the city of a neighborhood including increased property values, increased quality of life and health, and reduced unproductive time in traffic will not be realized without addressing the regional system in which a community exists. The city would also benefit from the transit system, as properties near transit stops have been shown to increase in value, and provide some economic stimulus (Bartholemew and Ewing 2011, 20; Cervero 1997). Developers and proponents of New Urbanism can pressure the regional government and transportation authority to capitalize on these new developments by extending and improving regional transportation systems, focusing on the benefit of property taxes, quality of life, and reduced health costs.

#### *Publicizing the Virtues of New Urbanism*

The responsibility for publicizing New Urbanism should fall on developers and city governments, as well as New Urbanism advocacy groups. As a new planning method with only a few well-known neighborhoods, significant publicity is necessary to convince the potential consumers, builders, and investors of the project that it can be successful. Developers need to understand the benefits of TOD and New Urbanism in terms of higher property values, long-term success, and growing demand. Cities that wish to increase New Urban neighborhoods, as well as New Urbanism advocacy groups can advertise these benefits to developers. Financing these projects can be difficult because investors are not willing to take on the perceived risk of this alternative development type, especially with its mixed-use zones and buildings that do not easily sell on the

secondary market. However, developers and governments alike can clarify the benefits and reduced risk of New Urbanism, by exhibiting the local and national market demand for such developments, their economic viability in the long term, and the competence and experience of New Urbanism developers (Venner and Ecola 2007, 17). Finally, developers and cities can advertise New Urbanism to potential homeowners to reduce the actual risk of the development. Beyond these groups, academic research on the impact of New Urbanism on the many factors that governments, developers, and investors care about will improve confidence in New Urban design and provide material for New Urbanism proponents to convince doubters of the feasibility and benefits of a project. There is already a growing demand for walkable areas with a mix of uses that are connected to public transportation (Ellis 2002, 271). However, especially in sprawled cities, outlining the benefits to quality of life and reduced transportation costs to homebuyers can increase the attractiveness of New Urbanism and reduce the risk of not selling properties.

#### *Publish Ex Post Studies*

There is a growing body of literature that supports the profitability of New Urbanism, and its many virtues for building community, reducing carbon emissions, and helping to revitalize local economies (Bohl 2000; Ellis 2002; Hanlon 2010; Lund 2003). The profitability of these developments is fairly well researched and presented. However, there are few studies that analyze the predicted benefits of a project compared to the actual impact once it has been built. Developers, financial institutions, and local governments may be hesitant to pursue New Urban projects when there is no evidence that they will end up being as profitable as predicted. Researchers could conduct these

impact analyses on projects that include considerations such as whether the project occurred on schedule, and the discount rates of the timeline to determine the true rate of return compared to the predicted. They can analyze whether there were changes in a project's plans since the predicted fiscal impact analysis was conducted, and make adjustments to compare the predicted values and the actual values accurately. These studies would help convince potential stakeholders in New Urban projects that these projects can be profitable, as well as enlighten analysts as to best practices in fiscal impact forecasting for New Urban developments.

#### *Target Friendlier Areas*

As outlined previously, there are many settings in which New Urbanism and TOD will likely not be successful and should not be applied. There are also many settings for which New Urbanism design techniques are possible, but the implementation might be extremely difficult and require compromises that weaken the designs' effect. The context of a development is often ignored by developers and municipal leaders alike, to the demise of many New Urban and TOD developments. For example, critics of the HOPE IV program worry that the New Urban level of density is actually suburbanizing existing dense areas of low-income housing (Bohl, 780-781). In areas where densities are already very high, in places such as downtown New York or Chicago, it may be detrimental to implement New Urban densities. Developers and city leaders would benefit from identifying areas where they are most likely to accomplish New Urbanism, and where it would have the largest positive effect on the area. For instance, many critics of New Urbanism have focused on the reduced positive effect that comes from building a New Urban neighborhood in a sea of suburbs. As outlined previously, some factors developers

can look for in a target area are a. large, relatively unused outdoor spaces, b. areas in need of moderate revitalization, c. areas with historically New Urban style patterns of development, d. areas in need of historical restoration, e. places connected to the transit system, f. where state and local growth policies make New Urbanism more economically feasible, and g. ecologically sensitive areas. Large sums of money and reputation can be lost because of New Urban developers failing to consider context. Each individual city will have many different contexts that developers and municipal officials should consider when planning a neo-traditional development, but they should spend some time analyzing the community, and target areas that they predict to be most successful economically, politically, and in converting drivers into walkers, bikers, and transit users.

### *Coalitions*

New Urban and transit-oriented design are beneficial to many aspects of a community, which have powerful interests groups that can contribute to political pressure and advertisement efforts for New Urban development. Coalitions can be formed of these interest groups to strengthen New Urbanism advocacy efforts. Because of the planning doctrine's pedestrian-oriented elements, New Urban design promotes healthier lifestyles and safer pedestrians. The health sector, including NGOs and government agencies benefit from spreading New Urbanism, and can be recruited to join a New Urbanism coalition. The environmental sector also benefits greatly from New Urbanism as the style reduces vehicle miles and the carbon footprint of urban residents. Economic interests often benefit from New Urban communities, because the design promotes less car use, freeing up income to spend locally (Speck 2012, 29). Low-income families benefit from cheap transportation and access to employment without paying the high housing prices in

areas close to downtown (Speck 2012, 30). Additionally, a study in Baltimore revealed that every million spent on bike infrastructure creates around 14 jobs, pedestrian infrastructure creates 11 jobs, and road infrastructure creates only seven jobs (Garrett-Peltier 2010, 2). This difference occurs because road construction is less labor intensive and more material and machine intensive, road construction has a lower ratio of engineering costs to construction costs, and engineering also employs more people per dollar spent than construction (Garrett-Peltier 2010, 2). Both economic justice and local economic advocacy groups would benefit a coalition of New Urbanism advocates. Community groups gain strength from New Urbanism as research has shown the design style increases sense of community and social interaction (Flint 2010, 72; Hollie 2003, 414; Meredith 2003, 494). As mentioned previously, one of the most successful examples of TOD is Fruitvale Transit Village in Oakland, California, which was spearheaded by the community group, the Unity Council. The Council advocated for the village to the city government, and eventually worked with the City and developers to design and build the Village. This example shows the power of involving multiple interests in New Urbanism and TOD advocacy. Since many of the barriers to New Urbanism are political, a coalition can be a powerful force in convincing a city government to make the changes to allow New Urbanism projects to be built.

## **Chapter 6 Conclusion**

This thesis has demonstrated that New Urbanism is both advisable and feasible in many circumstances. Residents who live in New Urban areas generally had lower car use and higher levels of walking and use of other forms of transportation than other development styles, whether in urban or suburban contexts. This reduction in gasoline consumption, alongside the smaller homes and subsequent energy use, reduces the carbon footprint of New Urban neighborhoods. These neighborhoods are in demand, as shown by the housing price premia on New Urban homes. This increase in prices also contributes to New Urbanism's economic feasibility. Financing a New Urban project can be challenging. However, as the development style increases in popularity, developers are facing less difficulty finding investors who have confidence the property will sell at a high price and a reasonable pace. New Urbanism is politically desirable as well, since local governments benefit from the property tax revenue, sales tax revenue, small economic revitalization, and green reputation of New Urban neighborhoods.

New Urbanism does face challenges, mostly stemming from the lack of understanding and expertise among developers, investors, and planners. Many financial institutions are hesitant to provide loans for non-traditional projects that have a longer timeline for selling properties. Developers may also lack expertise in the fairly new doctrine, and are often unaware of its profitability. Planners frequently face restricting zoning codes and policy incentives at all levels of government that make New Urbanism difficult to accomplish, and many are resistant to taking the time to make adjustments. However, these challenges can be overcome by implementing key policy changes and strategic enactment measures. Municipalities can give tax incentives for incorporating

New Urban design into a development, or pay for infrastructure improvement costs. City officials can also revise the zoning code to allow higher densities, reduce parking requirements, zone for mixed-use areas, reduce required street width, and increase bike lane requirements. Officials can also adjust state policies to allow form-based zoning codes or New Urban/Traditional Neighborhood Development ordinances at the local level. Federal policies that provide financial incentives for buying large houses can be removed or reduced to increase the demand for denser housing. To inform and persuade all relevant actors, all levels of government can provide financing options for New Urban developments to address the financial barrier developers face with the non-traditional development style. The regional transportation system can be improved and expanded to strengthen the effect of New Urbanism on reducing car use. The virtues of New Urbanism can be publicized by many entities to increase understanding and confidence in the planning doctrine. Coalitions can also be used to increase political and economic viability since many community interests benefit from New Urbanism.

The New Urban planning doctrine is an advisable strategy to reduce the carbon footprints of urban communities, and by making adjustments in government policies and employing strategic enactment measures, the development approach can spread. New Urbanism has very strong potential to have a significant positive impact on urban sustainability.

## References

- Advisory Committee on Zoning. 1926. A Standard State Zoning Enabling Act: Under Which Municipalities may Adopt Zoning Regulations.
- American Public Transit Association. 1998. *A Topical Guide to Funding Provisions of the Intermodal Surface Transportation Efficiency Act and Related Laws, including FY 1998 Appropriation Act and FY 1998 Six-month ISTEA Extension Act*. Washington, D.C.
- Armington, Catherine, and Marjorie Odle. 1982. Small Business: How Many Jobs? *The Brookings Review* 1 (2): 14-7.
- ARUP. *Copenhagen: Solutions for Sustainable Cities*. 2012. Copenhagen, Denmark.
- Ascher, William, and Natalia Mirovitskaya. 2013. *Development Strategies, Identities, and Conflict in Asia*. Palgrave Macmillan.
- Avi-Yonah, Reuven S., and David M. Uhlmann. 2009. Combating Global Climate Change: Why a Carbon Tax is a Better Response to Global Warming than Cap and Trade. *Stanford Environmental Law Journal* 28 (3).
- BAE Urban Economics. 2011. *Summary Report on the Economic Impact of the State Senter Project*, Baltimore, MD.
- Bartholomew, Keith, and Reid Ewing. 2011. Hedonic Price Effects of Eedestrian-and Transit-oriented Development. *Journal of Planning Literature* 26 (1): 18-34.
- Bartling, Hugh. 2004. The Magic Kingdom Syndrome: Trials and Tribulations of Life in Disney's Celebration. *Contemporary Justice Review* 7 (4): 375-93.
- Berke, Philip R., Joe MacDonald, Nancy White, Michael Holmes, Dan Line, Kat Oury, and Rhonda Ryznar. 2003. Greening Development to Protect Watersheds: Does New Urbanism Make a Difference? *Journal of the American Planning Association* 69 (4): 397-413.
- Berkowitz, Eric. 2005. The subway mayor. *LA Weekly*, August 18, 2005, 2005.
- Biddle, Tony, T. Bertola, Stephen Greaves, and Peter Stopher. 2006. The Costs of Infill Versus Greenfield Development: A Review of Recent Literature. Paper presented at 29th Australian Transport Research Forum, Gold Coast, Queensland, Australia.
- Bohl, Charles C. 2000. New Urbanism and the City: Potential Applications and Implications for Distressed Inner-city Neighborhoods. *Housing Policy Debate* 11 (4): 761-801.

- Böhringer, Christoph, Andreas Löschel, Ulf Moslener, and Thomas F. Rutherford. 2009. EU Climate Policy up to 2020: An Economic Impact Assessment. *Energy Economics* 31: S295-305.
- Bowes, David R., and Keith R. Ihlanfeldt. 2001. Identifying the Impacts of Rail Transit Stations on Residential Property Values. *Journal of Urban Economics* 50 (1): 1-25.
- Browner, Seth. 2014. The Post-World War II Suburb in the United States. *Trinity College Digital Repository*, Hartford, CT
- Bruvoll, Annegrete, and Bodil Merethe Larsen. 2004. Greenhouse Gas Emissions in Norway: Do Carbon Taxes Work? *Energy Policy* 32 (4): 493-505.
- Burke, Lisa Ludlow. 1995. Understanding the Interaction between Financing and Design: Case Studies in Urban Mixed-use Development. *Massachusetts Institute of Technology*.
- Camagni, Roberto, Maria Cristina Gibelli, and Paolo Rigamonti. 2002. Urban Mobility and Urban Form: The Social and Environmental Costs of Different Patterns of Urban Expansion. *Ecological Economics* 40 (2): 199-216.
- Cappell, Charles, and IL DeKalb. 2005. A Case Study in Planned Growth: An Evaluation of a Proposed Elgin IL Annexation and Developments in the Context of Smart Growth and New Urbanism. Paper presented at Annual Meeting of the American Sociological Association Philadelphia, PA.
- Carr, Riggs, and Ingram, LLC. 2012. *Celebration Community Development District Financial Statements*.
- Carroll, Archie B. 1999. Corporate Social Responsibility Evolution of a Definitional Construct. *Business & Society* 38 (3): 268-95.
- Cervero, Robert. 2006. *Transit Oriented Development's Ridership Bonus: A Product of Self-selection and Public Policies*. University of California Transportation Center.
- Cervero, Robert, and Michael Duncan. 2002. Land Value Impacts of Rail Transit Services in Los Angeles County. *Report Prepared for National Association of Realtors Urban Land Institute*.
- Cervero, Robert, and John Landis. 1997. Twenty Years of the Bay Area Rapid Transit System: Land Use and Development Impacts. *Transportation Research Part A: Policy and Practice* 31 (4): 309-33.
- Chen, Ted, and Irene Moore. 2014. LA's "subway to the sea" makes headway with new \$2.1 billion fund. *NBC Los Angeles*, May 21 2014, 2014, sec Local News.

- Cisler, Steve. 1999. Letter from a Community Networker: Celebration, Florida. *First Monday* 4 (11).
- City of Oakland. 2008. *Fruitvale Transit Village Phase 2 Initial Study and Environmental Review Checklist*.
- Condon, Patrick M., Duncan Cavens, and Nicole Miller. 2009. *Urban Planning Tools for Climate Change Mitigation*. Lincoln Institute of Land Policy, Cambridge, MA.
- Congress of the New Urbanism, "Charter of the New Urbanism." [database online]. 20112015]. Available from <http://www.cnu.org/charter>.
- Crane, Randall, and Richard Crepeau. 1998. Does Neighborhood Design Influence Travel?: A Behavioral Analysis of Travel Diary and GIS Data. *Transportation Research Part D: Transport and Environment* 3 (4): 225-38.
- Cubasch, Ulrich, Donald Weubbles, Dialang Chen, Maria Cristina Facchini, David Frame, Natalie Mahowald, and Jan-Gunnar Winther. 2013. Introduction. In *Climate Change 2013: The physical science basis. Contribution of Working Group I to the fifth assessment report of the Intergovernmental Panel on Climate Change*, eds. T. F. Stocker, D. Qin, G. -K Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, Bex V. and P. M. Midgley. Cambridge, United Kingdom, and New York, NY, USA: Cambridge University Press.
- Day, Kristen. 2003. New Urbanism and the Challenges of Designing for Diversity. *Journal of Planning Education and Research* 23 (1): 83-95.
- Delgado, Melvin. 1997. Role of Latina-owned Beauty Parlors in a Latino Community. *Social Work* 42 (5): 445-53.
- Dixon, Jennifer, and Ann Dupuis. 2003. Urban Intensification in Auckland, New Zealand: A Challenge for New Urbanism. *Housing Studies* 18 (3): 353-68.
- Dixon, Tim. 2011. Sustainable Urban Development to 2050: Complex Transitions in the Built Environment of Cities. *WP2011/5 October*.
- Dodman, David. 2009. Blaming Cities for Climate Change? An Analysis of Urban Greenhouse Gas Emissions Inventories. *Environment and Urbanization* 21 (1): 185-201.
- Dorsey, Joseph W. 2003. Brownfields and greenfields: The Intersection of Sustainable Development and Environmental Stewardship. *Environmental Practice* 5 (01): 69-76.

- Edenhofer, Ottmar, Ramon Pichs-Madruga, Youba Sokona, and Kristin Seyboth. 2011. IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation. *IPCC*.
- Edwards, A. Trystan. 1913. A Criticism of the Garden City Movement. *Town Planning Review* 4 (2): 150.
- Ellis, Cliff. 2002. The New Urbanism: Critiques and Rebuttals. *Journal of Urban Design* 7 (3): 261-91.
- Enkvist, P., Tomas Nauc ler, and Jerker Rosander. 2007. A Cost Curve for Greenhouse Gas Reduction. *McKinsey Quarterly* 1: 34.
- European Renewable Energy Council, "CO2." [database online]. 20122015]. Available from <http://www.erec.org/statistics/co2.html>.
- Fabos, Julius Gy. 1995. Introduction and Overview: The Greenway Movement, Uses and Potentials of Greenways. *Landscape and Urban Planning* 33 (1): 1-13.
- Fannie Mae, "Selling guide: B4-2.1-02: Ineligible projects." [database online]. 20142015]. Available from <https://www.fanniemae.com/content/guide/selling/b4/2.1/02.html#Commercial.20Space.20and.20Mixed-Use.20Allocation>.
- Farris, J. Terrence. 2001. The Barriers to Using Urban Infill Development to Achieve Smart Growth. *Housing Policy Debate* 12 (1).
- Filipek, Erica, and Raemeka Gant. 2004. *New Residential Construction in December 2003*. US Census Bureau, CB04-09.
- Flint, Anthony. 2005. *The Density Dilemma: Appeal and Obstacles for Compact and Transit-oriented Development*. Lincoln Institute of Land Policy Working Paper, Cambridge, Massachusetts.
- Florida Department of Transportation, and Central Florida Commuter Rail Transit. 2009. *Economic and Fiscal Impact of Future Station Transit Oriented Development: Altamonte Station, Seminole County*.
- Flyvbjerg, Bent, Massimo Garbuio, and Dan Lovoalio. 2009. Delusion and Deception in Large Infrastructure Projects: Two Models for Explaining and Preventing Executive Disaster. *California Management Review* 51 (2): 170-93.
- Friel, Sharon, Alan D. Dangour, Tara Garnett, Karen Lock, Zaid Chalabi, Ian Roberts, Ainslie Butler, Colin D. Butler, Jeff Waage, and Anthony J. McMichael. 2009. Public Health Benefits of Strategies to Reduce Greenhouse Gas Emissions: Food and Agriculture. *The Lancet* 374 (9706): 2016-25.

- Garde, Ajay M. 2004. New Urbanism as Sustainable Growth? A Supply Side Story and its Implications for Public Policy. *Journal of Planning Education and Research* 24 (2): 154-70.
- Garrett-Peltier, Heidi. 2010. Estimating the Employment Impacts of Pedestrian, Bicycle, and Road Infrastructure: Case Study: Baltimore. *Transportation Research Board*.
- Gillingham, Kenneth, Richard G. Newell, and Karen Palmer. 2009. Energy Efficiency Economics and Policy. *National Bureau of Economic Research*.
- Glaeser, Edward L., and Matthew E. Kahn. 2010. The Greenness of Cities: Carbon Dioxide Emissions and Urban Development. *Journal of Urban Economics* 67 (3): 404-18.
- Govindasamy, Bala, and Ken Caldeira. 2000. Geoengineering Earth's Radiation Balance to Mitigate CO<sub>2</sub>-induced Climate Change. *Geophysical Research Letters* 27 (14): 2141-4.
- Gradus, Raymond, and Sjak Smulders. 1993. The Trade-off between Environmental Care and Long-term Growth—Pollution in Three Prototype Growth Models. *Journal of Economics* 58 (1): 25-51.
- Grant, Jill L. 2009. Theory and Practice in Planning the Suburbs: Challenges to Implementing New Urbanism, Smart Growth, and Sustainability Principles 1. *Planning Theory & Practice* 10 (1): 11-33.
- Gross, Robert, Matthew Leach, and Ausilio Bauen. 2003. Progress in Renewable Energy. *Environment International* 29 (1): 105-22.
- Gyourko, Joseph E., and Witold Rybczynski. 2000. Financing New Urbanism Projects: Obstacles and Solutions. *Housing Policy Debate* 11 (3): 733-50.
- Handy, Susan. 2005. Smart Growth and the Transportation-land Use Connection: What does the Research Tell us? *International Regional Science Review* 28 (2): 146-67.
- Handy, Susan L. 1996. Urban Form and Pedestrian Choices: Study of Austin Neighborhoods. *Transportation Research Record: Journal of the Transportation Research Board* 1552 (1): 135-44.
- Hanlon, James. 2010. Success by Design: HOPE VI, New Urbanism, and the Neoliberal Transformation of Public Housing in the United States. *Environment and Planning* 42 (1): 80.
- Hart, Stuart L., and Gautam Ahuja. 1996. Does it Pay to be Green? An Empirical Examination of the Relationship between Emission Reduction and Firm Performance. *Business Strategy and the Environment* 5 (1): 30-7.

- Hendrickson, Chris, Deborah Lange, Yeganeh Mashayekh, Amy Nagengast, and Shengnan Zhang. 2012. Estimation of Comparative Life Cycle Costs and Greenhouse Gas Emissions of Residential Brownfield and Greenfield Developments.
- Hess, Daniel Baldwin, and Tangerine Maria Almeida. 2007. Impact of Proximity to Light Rail Rapid Transit on Station-area Property Values in Buffalo, New York. *Urban Studies* 44 (5-6): 1041-68.
- Hogan, William W., and Dale W. Jorgenson. 1991. Productivity Trends and the Cost of Reducing CO<sub>2</sub> Emissions. *The Energy Journal* 12 (1): 67-85.
- Holmes, Joe, and James van Hemert. 2008. *Transit Oriented Development*. Rocky Mountain Land Use Institute.
- Hourcade, Jean-Charles, and John Robinson. 1996. Mitigating Factors: Assessing the Costs of Reducing GHG Emissions. *Energy Policy* 24 (10): 863-73.
- Huang, Wei Ming, Grace WM Lee, and Chih Cheng Wu. 2008. GHG emissions, GDP Growth and the Kyoto Protocol: A Revisit of environmental Kuznets Curve Hypothesis. *Energy Policy* 36 (1): 239-47.
- Institute for Industrial Productivity. *Sweden's GHG Emissions Reduction Policy*. 2013. Washington, D.C.
- Institution of Transportation Engineers. 2010. *Contra Costa Center Transit Village*. Congress for the New Urbanism.
- Intergovernmental Panel on Climate Change. 2012. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge UK, and New York, NY, USA: Cambridge University Press.
- IPCC. 2013. Summary for policy makers. In *Climate change 2013: The physical science basis: Contribution of working group I to the fifth assessment report of the intergovernmental panel on climate change*. Cambridge, United Kingdom, and New York, NY, USA: Cambridge University Press.
- Jacobs, Jane. 1961. *The Death and Life of Great American Cities*. Vintage.
- Jaffe, Adam B., and Robert N. Stavins. 1994. The Energy Efficiency Gap: What Does it Mean? *Energy Policy* 22 (10): 804-10.
- Joh, Kenneth, Marlon G. Boarnet, Mai Thi Nguyen, William Fulton, Wally Siembab, and Susan Weaver. 2008. Accessibility, Travel Behavior, and New Urbanism: Case Study of Mixed-use Centers and Auto-oriented Corridors in the South Bay Region of

- Los Angeles, California. *Transportation Research Record: Journal of the Transportation Research Board* 2082 (1): 81-9.
- Kamal-Chaoui, Lamia, and Alexis Robert. 2009. *Competitive Cities and Climate Change*. OECD Publishing.
- Katz, Peter. 2013. Taking sides: Why Planners Must Rethink the Idea of Neutrality. *Better Cities & Towns*, 29 May 2013, 2013.
- Kenny, Judith T., and Jeffrey Zimmerman. 2004. Constructing the 'Genuine American City': Neo-traditionalism, New Urbanism and Neo-liberalism in the Remaking of Downtown Milwaukee. *Cultural Geographies* 11 (1): 74-98.
- Kim, Queena. 2012. Another Silicon Valley perk, shuttle service. *Marketplace*, December 26, 2012, 2012, sec Tech.
- Kirby, Alex, and Jasmina Bogdanovi . 2008. *Kick the Habit: A UN Guide to Climate Neutrality*. UNEP/Earthprint.
- Kolozsvari, Douglas, and Donald Shoup. 2003. Turning Small Change into Big Changes. *Access Magazine* 1 (23).
- Kutscher, Charles F. 2007. Tackling Climate Change in the US: Potential Carbon Emissions Reductions from Energy Efficiency and Renewable Energy by 2030. *American Solar Energy Society*.
- Lal, Rattan. 2004. Carbon Emission from Farm Operations. *Environment International* 30 (7): 981-90.
- Lamer, Chad. 2003. Why Government Policies Encourage Urban Sprawl and the Alternatives Offered by New Urbanism. *Kansas Journal of Law & Public Policy* 13: 391.
- Landis, John, Subhrajit Guhathakurta, and Ming Zhang. 1994. Capitalization of Transit Investments into Single-family Home Prices: A Comparative Analysis of Five California Rail Transit Systems. *University of California Transportation Center*.
- Larsen, Kristin. 2005. New Urbanism's Role in Inner-city Neighborhood Revitalization. *Housing Studies* 20 (5): 795-813.
- Leinberger, Chris. 2001. Financing Progressive Development. *The Capital Xchange Journal*.
- Lewald, A., and R. Bowie. 1993. What is Happening with the Swedish Technology Procurement Program? A Condensed Version of the Procurement Program's First Process and Impact Evaluation. In *Proceedings of 1993 ECEEE summer study on*

*energy efficiency in buildings*. 81. The European Council for an Energy-Efficient Economy Oslo, Norway.

Lewyn, Michael. 2006. New Urbanist Zoning for Dummies. *GWU Legal Studies Research Paper* (183).

Lindgreen, Adam, and Valerie Swaen. 2010. Corporate Social Responsibility. *International Journal of Management Reviews* 12 (1): 1-7.

Local Government Commission, Council of Infill Builders, and Urban 3. 2013. *Valuing Downtowns: Upward not Outward is a Smart Revenue Strategy for Local Governments*.

Loukaitou-Sideris, Anastasia. 2010. A New-found Popularity for Transit-oriented Developments? Lessons from Southern California. *Journal of Urban Design* 15 (1): 49-68.

Loutskina, Elena. 2011. The Role of Securitization in Bank Liquidity and Funding Management. *Journal of Financial Economics* 100 (3): 663-84.

Lund, Hollie. 2003. Testing the Claims of New Urbanism: Local Access, Pedestrian Travel, and Neighboring Behaviors. *Journal of the American Planning Association* 69 (4): 414-29.

Mallory, Mindy. 2010. How will Cap-and-trade Affect Firms and Farms? *University of Illinois Board of Trustees*.

Markusson, Nils, Florian Kern, Jim Watson, Stathis Arapostathis, Hannah Chalmers, Navraj Ghaleigh, Philip Heptonstall, Peter Pearson, David Rossati, and Stewart Russell. 2012. A Socio-technical Framework for Assessing the Viability of Carbon Capture and Storage Technology. *Technological Forecasting and Social Change* 79 (5): 903-18.

Martinez, Arabella, Cohen, Patricia H. and O'Hare, Shanna. Fruitvale Transit Village Project. in USDOT Federal Highway Administration [database online]. 20112015]. Available from [http://www.fhwa.dot.gov/environment/environmental\\_justice/case\\_studies/case6.cfm](http://www.fhwa.dot.gov/environment/environmental_justice/case_studies/case6.cfm).

Maryland Department of Transportation, City of Baltimore Planning Department, and Maryland Department of Planning. 2005. *State Center Transit Oriented Development Strategy*. Baltimore, MD.

Mayo, Raemeka, and Stephen Cooper. 2015. *New Residential Construction in February 2015*. Washington, D.C.: US Census Bureau, CB15-43.

- Mayo, Raemeka, and Stephen Cooper. 2014. *New Residential Construction in December 2013*. Washington, D.C.: US Census Bureau, CB14-12.
- Meredith, Jeremy R. 2003. Sprawl and the New Urbanist Solution. *Virginia Law Review*: 447-503.
- Metropolitan Transportation Commission. 2006. *Pedestrian Districts Study: Telegraph Avenue and Fruitvale BART Station TOD*.
- Natural Resources Defense Council, "Cleaner and Cheaper: Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants." [database online]. 20142015]. Available from <http://www.nrdc.org/air/pollution-standards/>.
- New urbanism. in Newurbanism.org [database online]. Alexandria, VA, [cited October 5 2014]. Available from <http://newurbanism.org>.
- Njoh, Ambe. 2009. New Urbanism, an Alternative to Traditional Urban Design: The Case of Celebration, Florida, USA. *Unpublished Case Study Prepared for the Global Report on Human Settlements*.
- Nyman, Pia. 1998. Environmental Taxes: The Case of Sweden. *Citeseer*.
- Ockwell, David, Lorraine Whitmarsh, and Saffron O'Neill. 2009. Reorienting Climate Change Communication for Effective Mitigation: Forcing People to be Green or Fostering Grass-roots Engagement? *Science Communication* 30 (3).
- OECD. *Environmental Performance Reviews: Germany 2012 Highlights*. 2012.
- Parmesan, Camille. 2006. Ecological and Evolutionary Responses to Recent Climate Change. *Annual Review of Ecology, Evolution, and Systematics*: 637-69.
- Peters, Glen P. 2010. Carbon Footprints and Embodied Carbon at Multiple Scales. *Current Opinion in Environmental Sustainability* 2 (4): 245-50.
- Planning Design Group. 2007. Economic Return on New Urbanism: A Summary of Focus Group Discussions of Developers and Practitioners of New Urbanism in Central Florida.
- Poole, Robert. Fruitvale Village: A Model for Transit-oriented Development. in Global Site Plans [database online]. 2013. Available from <http://www.globalsiteplans.com/environmental-design/urban-planning-and-design/fruitvale-village-a-model-for-transit-oriented-development/>.
- Pushkar, Anna O., Brian J. Hollingworth, and Eric J. Miller. 2000. A Multivariate Regression Model for Estimating Greenhouse Gas Emissions from Alternative

- Neighborhood Designs. Paper presented at 79th annual meeting of the Transportation Research Board, Washington, DC.
- Rabinovitch, Jonas. 1992. Curitiba: Towards Sustainable Urban Development. *Environment and Urbanization* 4 (2): 62-73.
- Renne, John L. 2008. Smart Growth and Transit-oriented Development at the State Level: Lessons from California, New Jersey, and Western Australia. *Journal of Public Transportation*: 77.
- Sallis, James F., Robert B. Cervero, William Ascher, Karla A. Henderson, M. Katherine Kraft, and Jacqueline Kerr. 2006. An Ecological Approach to Creating Active Living Communities. *Annual Review of Public Health* 27: 297-322.
- Sherman, Natalie. 2015. City presses for state center approval. *The Baltimore Sun*, January 22, 2015, 2015, sec Real Estate.
- Shibley, Robert, Emily Axelrod, Jay Farbstein, and Richard Wener. 2005. *Silver medal winner, Fruitvale Village, Oakland, California*. Rudy Bruner Award for Urban Excellence.
- Shove, Elizabeth. 2010. Beyond the ABC: Climate Change Policy and Theories of Social Change. *Environment and Planning* 42 (6): 1273.
- Sitkowski, Robert J., and Brian W. Ohm. 2006. Form-based Land Development Regulations. *Urban Lawyer* 38: 163.
- Song, Yan, Philip R. Berke, and Mark R. Stevens. 2009. Smart Developments in Dangerous Locations: A Reality Check of Existing New Urbanist Developments. *International Journal of Mass Emergencies and Disasters* 27 (1): 1-24.
- Song, Yan, and Gerrit-Jan Knaap. 2004. Measuring Urban Form: Is Portland Winning the War on Sprawl? *Journal of the American Planning Association* 70 (2): 210-25.
- Song, Yan and Gerrit-Jan Knaap. 2003. New Urbanism and Housing Values: A Disaggregate Assessment. *Journal of Urban Economics* 54 (2): 218-38.
- Sonoran Institute. 2012. About town: Building Revenue for Communities.
- Southworth, Michael, and Eran Ben-Joseph. 1995. Street Standards and the Shaping of Suburbia. *Journal of the American Planning Association* 61 (1): 65-81.
- Speck, Jeff. 2012. *Walkable City: How Downtown Can Save America, One Step at a Time*. New York: North Point Press.

- Stein, Jonathan, and Michael Beckel. 2006. A Guide to Environmental Non-profits. *Mother Jones*, March/April 2006, 2006, sec Environment.
- Stern, Nicholas Herbert. 2007. *The Economics of Climate Change: The Stern Review*. Cambridge University Press.
- Steuteville, Robert. 2000. The New Urbanism: An Alternative to Modern, Automobile-oriented Planning and Development. *New Urban News*: 1-6.
- Strategic Economics. 2013. *Fiscal Impact Analysis of Three Development Scenarios in Nashville-Davidson County, TN*. Smart Growth America.
- Strickland, Eliza. 2006. Ghost town: What if they built the development of the future and no one came? *Easy Bay Express*, January 6, 2006, 2006.
- Sustainable Communities, "Final element completed in massive TOD project: Apartments already fully leased." [database online]. Contra Costa, CA, Available from <http://www.p4sc.org/articles/all/final-element-completed-massive-tod-project-apartments-already-fully-leased>.
- Swaney, James A. 1992. Market Versus Command and Control Environmental Policies. *Journal of Economic Issues* 26 (2): 623-33.
- Swedish National Audit Office. *Energy Efficiency in Industry: Effects of Central Government Action*. 2013. 8.
- Talen, Emily. 2013. Zoning For and Against Sprawl: The Case for Form-Based Codes. *Journal of Urban Design* 18 (2): 175-200.
- Teller, Edward, Lowell Wood, and Roderick Hyde. 1996. *Global Warming and Ice Ages: Prospects for Physics-Based Modulation of Global Change*.
- Toby, DC, CK Kalynn Cory, and WA Emily. 2011. *Policymaker's Guide to Feed-in Tariff Policy Design: Technical Report*. NREL.
- Tol, Richard SJ. 2002. Estimates of the Damage Costs of Climate Change Part 1: Benchmark Estimates. *Environmental and Resource Economics* 21 (1): 47-73.
- Torres, Blanca. 2013. Unity council chases funds for Fruitvale Transit Village Phase II. *San Francisco Business Times*, October 9, 2013, 2013.
- Tu, Charles C., and Mark J. Eppli. 1999. Valuing New Urbanism: The Case of Kentlands. *Real Estate Economics* 27 (3): 425-51.
- U.S. Energy Information Administration. 2013. *International Energy Outlook 2013, with projections to 2040*. Washington, D.C.: DOE/EIA-0484.

- United States Environmental Protection Agency. Clean air act permitting for greenhouse gases. [database online]. 20152015]. Available from <http://www.epa.gov/nsr/ghgpermitting.html>.
- United Nations Environment Programme. International Resource Panel. 2011. *Decoupling natural resource use and environmental impacts from economic growth*. UNEP/Earthprint.
- United States Department of State. 2010. *US climate Action Report 2010*. Washington: Global Publishing Services.
- Venner, Marie, and Lisa Ecola. 2007. Financing Transit-oriented Development: Understanding and Overcoming Obstacles. *Transportation Research Record: Journal of the Transportation Research Board* 1996 (1): 17-24.
- Veregge, Nina. 1997. Traditional Environments and the New Urbanism: A Regional and Historical Critique. *Traditional Dwellings and Settlements Review*: 49-62.
- Voith, Richard. 1999. Does the Federal Tax Treatment of Housing Affect the Pattern of Metropolitan Development? *Federal Reserve Bank of Philadelphia, Business Review*, March/April.
- Walmsley, Anthony. 2006. Greenways: Multiplying and Diversifying in the 21st century. *Landscape and Urban Planning* 76 (1): 252-90.
- Walther, Gian-Reto, Eric Post, Peter Convey, Annette Menzel, Camille Parmesan, Trevor JC Beebee, Jean-Marc Fromentin, Ove Hoegh-Guldberg, and Franz Bairlein. 2002. Ecological Responses to Recent Climate Change. *Nature* 416 (6879): 389-95.
- Wharton School of Business. 2012. Why companies can no longer afford to ignore their social responsibilities. *Time*, May 28 2012, 2012, sec Management & Leadership.
- Whittemore, Andrew H. 2013. How the Federal Government Zoned America: The Federal Housing Administration and Zoning. *Journal of Urban History* 39 (4): 620-42.
- Wilson, Elizabeth J., S. Julio Friedmann, and Melisa F. Pollak. 2007. Research for Deployment: Incorporating Risk, Regulation, and Liability for Carbon Capture and Sequestration. *Environmental Science & Technology* 41 (17): 5945-52.
- Wuebbles, Donald J., and Atul K. Jain. 2001. Concerns about Climate Change and the Role of Fossil Fuel Use. *Fuel Processing Technology* 71 (1): 99-119.