

FIGHTING TRAFFIC CONGESTION IN METROPOLITAN PHOENIX BY MAKING
PUBLIC TRANSPORTATION A SUCCESS

A Synthesis Project Presented

by

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Submitted to the Office of Graduate Studies, University of Massachusetts Boston,
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

May 2007

Critical and Creative Thinking Program

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ABSTRACT

FIGHTING TRAFFIC CONGESTION IN METROPOLITAN PHOENIX BY MAKING PUBLIC TRANSPORTATION A SUCCESS

May 2007

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The past two years in the Critical and Creative Thinking Graduate Program have been a time of learning and life changing experiences. I found the confidence to make a career change and gained the knowledge and tools necessary to study the complex problem of traffic congestion and attempt to solve it by utilizing public transportation. My plan to move to Phoenix, Arizona in 2009 motivated me not only to learn about the area and its attempts to fight urban sprawl and traffic congestion, but also to attempt to find solutions to these problems. I utilized creative thinking and critical thinking skills to understand the complexity of the problem, analyze the problem, and make suggestions that could help solve the problem.

This synthesis project explores the rise of urban sprawl due to federal, state, and local policies regarding urban planning, and how urban sprawl led to a decline of public transportation usage and an increase in automobile dependence which in turn spawned traffic congestion. Traffic congestion problems have led to a loss of economic productivity, increased pollution, increased dependence on foreign oil, and the rise of health issues across America. By studying the current solutions being attempted across the United States and in Phoenix, I was able to understand what is working, what isn't, and why. Utilizing my critical thinking skills and creativity, I make suggestions on how Metropolitan Phoenix can reduce traffic congestion by promoting public transportation and making it a success. These suggestions attempt to make

public transportation a success in the area by using smart growth in urban planning, improving the existing transit system and ensuring future success, as well as instituting fee structures that will discourage citizens from utilizing the automobile as often as they do. The solutions I propose would involve the cooperation of federal, state, local officials as well as private business, and ultimately, the individual citizen. Undertaking this synthesis project not only educated me on the issues at hand, but I hope the product will educate the reader on the complexity of the problem and motivate them to become involved in trying to solve it.

I dedicate this synthesis project to my family, partner, and friends who have always supported me in all my endeavors. You all have given me the strength to succeed.

Thank You

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CHAPTER 1

INTRODUCTION

On a recent trip to Scotland in January 2007 to visit a friend getting a masters in environmental sciences at the University of Edinburgh, I became very interested in trying to get Americans to start using public transportation and depend less on their cars. We had an amazing discussion on how Americans can help save the environment and help fight global warming by simply using public transportation and reducing the amount of carbon dioxide released into the air. This discussion and my decision to move to Phoenix led us to also discuss the dismal state of most public transportation systems in American cities, especially those with low densities such as Phoenix. Before I knew it, these simple topics led to a great dialogue between the two of us for over three hours.

Looking back at the discussion with my friend, I find myself laughing on the inside as I realize that I am always evolving and changing my mind as I learn new things. I was originally a graduate student at the Boston Architectural College and planned to stay working at the architectural firm I was employed in, but as I began to have difficulty with my design ideas, I decided to join the Critical and Creative Thinking Program in an attempt to be more creative. I originally intended to only enroll in the certificate CCT Program, but as I progressed through the classes, I began to realize that I should follow my true passions career-wise and decided that I should go into real estate development. I even switched my original synthesis idea of finding a way for urban renewal without it leading to full gentrification, which I still feel would help me be a great real-estate developer. Although I am still interested in that idea, my dialogue with my friend made

me change my mind as I realized the gravity of the problem of urban sprawl and traffic congestion.

Most metropolitan areas in America tend to suffer from urban sprawl and traffic congestion. Urban sprawl is the mostly uncontrolled low density growth around an urban area, creating the byproduct of traffic congestion (Arapkiles et al, 1998). It is very evident in cities such as Los Angeles, Las Vegas, Dallas, Atlanta, Phoenix and many others all across the United States. Cities located in the West are great examples because they are fairly new cities, and are located in areas that have ample space to spread outward from their urban centers. These metropolitan areas are now working on addressing their urban sprawl and traffic congestion problems by using various methods such as urban growth boundaries, transit-oriented development, and the promotion of public transportation.

The success of public transportation in metropolitan areas such as Phoenix is quite difficult due to low density, and because most American cities are designed to be automobile dependant. Low density and traffic congestion, byproducts of urban sprawl, were the result of federal, state, and local laws concerning urban planning and development. The fact that American's love their cars and usually choose not to ride public transportation given the choice is another major reason for the continued problem of traffic congestion. These are great issues that must be overcome and I look forward to not only understanding them, but finding solutions by synthesizing what I have learned not only in the Critical and Creative Thinking Program, but as well as my eight years of living, working, and attending school in Boston.

In trying to understand the complexity of the urban sprawl and traffic congestion that plague most American cities, I began by looking at the history of their creation. I then explored the reasons why these problems and the various players are dependent on one another and why not just one player can solve the traffic congestion problem. Once I felt I understood the issue and its complexity, I took a look at Metropolitan Phoenix in Arizona and analyzed their current situation by studying what the city is currently attempting to do in order to solve their urban sprawl and traffic congestion problems. Believing that public transportation is one of the most important answers to this problem, I took a look at their current and future urban planning and transportation plans to see how effective they are. I point out what I think they are doing correctly and what they could do differently in order to ensure that public transportation is a success in Phoenix. I drew from examples of other cities, as well as from ideas from peers and my own opinions to come up with the ideas that might help Metropolitan Phoenix combat traffic congestion by making public transportation a success.

Understanding that there have been thousands of people trying to solve this issue all across America, and even in Phoenix, I believe that the Critical and Creative Program has given me the tools to approach this problem with a different point of view. Having lived in Boston and seeing how great public transportation can be in reducing traffic, I utilized my 'East Coast' point of view to look at the problems that Metropolitan Phoenix faces from a different angle. I utilized critical thinking techniques for various reasons. They helped me understand the complexity of the program by allowing me to put the problem into perspective and to understand how one variable greatly affected another. Upon learning to understand the complexity of the issues, I used critical thinking to help

me analyze the different methods already being attempted, and to be critical of the ideas I came up with to help solve this problem. I held and facilitated a dialogue session with peers to get an understanding of why people are hesitant to give up their cars and use public transportation; something I learned to do in my dialogue class. Lastly, after having analyzed the information gathered, I ultimately used what I learned in my creative thinking course to aid me in coming up with a new combination of solutions that I feel could help Metropolitan Phoenix tackle urban sprawl and make public transportation convenient and attractive to its citizens.

It is my hope that many people in the city of Phoenix can benefit from this synthesis project as much as I will. State and city governments in Arizona and the Maricopa County can use the information I gathered and my point of view in order to supplement their future plans for the area. I also hope that ordinary people will realize the benefits of using public transportation and the need to abandon their cars as well as what should be done in order to make public transportation a success. It is my hope that with my synthesis and general information the public knows about global warming, they will realize the benefits of public transportation in reducing pollution, and why it's important that it succeeds in Phoenix. Hopefully my project will inspire people to begin changing their driving habits and create momentum that will inspire the federal government to promote public transportation over automobiles, which in turn will reduce traffic and greatly help the environment by reducing carbon dioxide emissions.

My synthesis is formatted in a manner that will allow you, the reader, to understand the complexity of the problem of urban sprawl and traffic congestion as well as solutions currently proposed and being utilized by municipalities all across the

country. In Chapter 2 I explain the complexity of the problem and in Chapter 3 I discuss what is currently being done by communities in order to fight urban sprawl and traffic congestion. Chapter 4 will introduce the Greater Phoenix area and the current status of its public transportation and urban planning plans. Chapter 5 will explore the wide array of solutions that I suggest the City of Phoenix, in conjunction with the other communities in the area, could implement in order to stem urban growth and in turn make public transportation a more attractive and convenient alternative to the automobile. My suggestions range from utilizing urban planning and development, improving the transportation system itself, to a few more drastic measures such as creating toll roads and raising some taxes. In my opinion, once public transportation is made a success, it will ultimately lead to the reduction of traffic congestion. The last chapter, Chapter 6, will be a reflection on the creation of the synthesis project as well as my time in the Critical and Creative Thinking Program. I will close this chapter with an eye towards the future.

CHAPTER 2

UNDERSTANDING THE COMPLEXITY OF THE PROBLEM

In this chapter I will explore the rise of urban sprawl and how it came to be. This chapter will explain how the factors that created urban sprawl led to the rise and the dependence on the automobile in American cities. This dependence in conjunction with bad urban planning led to the rise of traffic congestion. Once this issue was realized to be a problem prevalent all across America, cities began to address it through various means. Urban planning and zoning that were once part of the problem have become part of the solution. Cities are now advocating smart growth as well as the promotion of public transportation which had been in decline as the automobile became the transportation method of choice.

Rise of Urban Sprawl

One of the major problems facing most metropolitan areas in the United States is that of urban sprawl, which has created a greater need for the use of the automobile, made public transportation unviable in most areas, and has led to the problem of traffic congestion and increase of carbon emissions by Americans. How did it begin? Why did it begin? In the following section, I will describe how urban sprawl came about and why it spawned the problem of traffic congestion.

Federal programs such as the interstate highway which allowed cities to continue to grow, the Federal Housing Administration mortgage insurance and other mortgage

programs, grant-in-aid programs for sewage and waste water treatment plants, influenced growth patterns and facilitated the development of areas that normally would not have been considered. These programs made it easier for state and local governments and developers to keep expanding from the historical centers of urban areas that led to an extravagant rate of land consumption that exceeds the rate at which the number of households being built can be sustained by metropolitan areas (Barnett, 2001). Federal highway programs which began to fully implement the Interstate Highway System, were beginning to take hold in the 1950s. As the federal government continued to fund these projects, cities were able to build the highways leading away from the city centers and out into suburban areas that would soon become America's suburbs (Barnett, 2001).

Major contributors to the rise of urban sprawl were the policies of the Home Owner Loan Corporation and the Federal Housing Administration in the 1930s and 1940s. These policies effectively red-lined urban areas where African Americans and low income families lived, making them ineligible for federal mortgage insurance which favored lower middle class and more affluent, white citizens. This resulted in white families being induced to move to newer suburban areas, further fueling urban sprawl growth, and leaving minorities and the poor to stay in urban centers (Barnett, 2001). By 1975, 75% of all CEOs of New York City based companies lived outside the city, ensuring that the wealthy were becoming further insulated from the poor (Madsen, 2001). My sister-in-law, who is originally from Detroit, Michigan, tells stories of how she is amazed when she goes back home to see how much downtown Detroit is full of minorities and the poor while the suburbs are full of mostly Caucasian wealthy and middle class individuals. These government policies became a complex mix of billions

of dollars in subsidies and poor federal, state, and local planning policies that encouraged urban sprawl (“Population Growth and...” n.d.).

Housing policies weren't the only factors that affected urban sprawl. A major factor was that of state and city zoning laws, which designate what type of usage is permitted in sectioned parcels of land. The laws divided the cities into residential, industrial, and commercial districts, thus dictating what type of structures could be built. These created islands of such specific land use, that an automobile was required to get past the vast residential tracts of land that intersected one commercial and/or industrial space from another (“Mixed-use Development,” 2006). Zoning laws (called Euclidian Zoning Laws) first began as a response to the intrusion of industry into cities, and the invention of tall buildings at the turn of the 20th century. New York City was the first city to enact Euclidian Zoning Laws in 1916 which not only limited building heights, but also separated incompatible activities such as keeping residences away from the noisy and dirty factories, and protecting neighborhood properties from big buildings that would block out the light from the sun. At the time of their inception, nobody imagined that urbanization would soon spill out of the cities and towns covering up whole metropolitan areas (Barnett, 2001 & “Mixed-use Development,” 2006).

Zoning was the sole shaping force for most regional development. While it does make sense to separate industry from housing, it has made the metropolitan regions of America far more fragmented and discontinuous than they should be (Barnett, 2001). As metropolitan areas spread, services such as hospital, schools, shopping centers, and others were duplicated while the existing urban ones went underutilized. This type of growth also led to most customer service oriented type of services such as financial, educational

(University), and others to be located in the historical center of a city while most manufacturing type services such as textiles and other factory type services to move to the outer portions of metropolitan areas in order to avoid residential areas and for the cheaper newly available land (Madsen, 2001).

The automobile became the primary means of transportation as urban sprawl continued to grow due to population growth. The declining of the real costs of gasoline, and the fact that Americans had fallen in love with the automobile and the freedoms it provided, led to a decline in community life, an increase in road congestion, a decrease in mass transit ridership, and ultimately, an increase in air pollution (Barnett, 2001). The increase of municipalities' land area and the separation of land usage due to zoning laws created a situation where public transportation was no longer adequate and the automobile was needed to get from place to place.

Since World War II, the two mutually reinforcing processes of decentralization and the increasing reliance of the automobile have continued to ensure that urban sprawl growth continues as well as traffic congestion (Autler & Belzer, 2002). The complexity of the interaction of federal laws in conjunction with state and local laws becomes apparent when one realizes that the problem keeps on growing due to the reinforcing of the status quo. The funding of highways by the federal government and the federal government's housing policies allowed cities to afford to expand from their urban centers and offer their citizens the opportunity to own their own property with a front and back yard. The funding subsidized growth that would have not been achieved through market forces alone. As Americans began to earn more, they could afford to buy their own

houses outside the city center and to own an automobile they could use to commute to work and get around the ever expanding city suburbs.

The zoning laws led to large parcels of land to be set aside for specific individual uses that soon led to the necessity of citizens needing to own an automobile in order to get from one section of the city to another. As cities began to expand tremendously over large areas of land and population density decreased, public transportation lost the ability to meet the needs of the citizens due to the greater convenience and need of the automobile. The losing of public transportation as an alternate form of transportation in many communities across America, only continued to add to the rise of automobiles on the roads. As the number of cars on the road increased, the highways built were quickly losing the ability to handle the high volume of traffic, leading to the rise of traffic congestion. The catalysts for urban sprawl and traffic congestion are all dependent on each other for perpetuating the problem, and ultimately, to solve it.

The factors that led to urban sprawl and continue to contribute to it are deeply rooted in the American psyche. Growing up with these mortgage policies, zoning laws, and racial policies of the Federal and local governments has led to generations of Americans feeling that this was normal, the correct way, and simply, the way of things; creating the American psyche. The American Dream, defined as owning your own home and car in the suburbs, was caused by this engrained American psyche (Arapkiles et al, 1998). Americans almost feel that owning an automobile is a birthright and not owning one is equivalent to having rights denied to them. This can be seen all across America as teenagers clamor for an automobile once they turn sixteen; I know I did. It is amusing to me to see that although many Americans feel urban sprawl is not a serious problem, they

highly detest traffic congestion; which is caused by urban sprawl. If we are to modify any of the forces that feed urban sprawl, it will require a fundamental change in the way that Americans think, and the way that urban development is managed (Barnett, 2001).

Urban Sprawl Side Effects

Urban sprawl has led to many side effects that are quite negative. These include the loss of rural and farming land that once was located in the outskirts of many communities throughout America, continued sprawl growth due to zoning laws, and the greatest effect, that of increased traffic congestion and all the problems associated with it. The negative side effects of growth and zoning will be discussed in this section, while serious side effect of traffic congestion will be discussed in the following section.

Since 1970, 86% of population growth occurred in the suburbs, partly due to continued low mortgage rates and government policies in promoting suburban expansion (Gordon & Richardson, 2000). Suburban expansion due to urban sprawl has led to 19 million acres of rural land being developed between 1970 and 1990. This translates to 400 thousand acres being bulldozed for new development in the outskirts of cities every year (Arapkiles et al, 1998). To show the severity of the problem, here are a few quick examples of urban sprawl run amuck. Urban land areas have been expanding on average, at twice the rate of the population (“Population Growth and...,”n.d.). In Portland, Oregon, the population grew 50% since 1975, but only expanded 2% area wise due to urban growth boundaries. In Philadelphia, Pennsylvania, the population grew 2.8% in the same amount of time, but grew 33% more land wise (“Myths and Fact Soundbites,” n.d.)

This disparity shows how urban sprawl is not indicative of population growth and thus can be controlled without leading to a problem of over crowding as some might suggest.

Current zoning laws continue to add to the problem of urban sprawl throughout American metropolitan areas by continuing to perpetuate the dividing of areas by residence only, commercial and industrial areas, but not a combination of all three. Even in residential zones, a hierarchy has been created by zoning laws. Huge tracts of land are designated for single family houses, while others are for apartments housing. Most neighborhoods built after the 1950s are designed like this, but those built before then have a successful mix of lot sizes and building types which are often within walking distance of neighborhood commercial centers. Although the latter are hard to sustain during economic hardships, they are often successful enough to function most of the time and still maintain these commercial centers within walking distance of residential areas. The opposite is true of newer developed neighborhoods as they require a person to ride an automobile to get to any commercial area (Barnett, 2001).

Another good example of zoning laws being highly inadequate and adding to urban sprawl growth is that of commercial-strip zoning. Back when urban areas were fairly small, it made sense to map commercial frontages continuously along trolley-car routes in city main streets, but not along arterial highways, as became the norm in the 1950s and 1960s. Commercial-strip zoning led to land not being used efficiently, and making it too narrow for there to be an efficient cluster of development in any one place. This type of zoning law has led to the familiar pattern across the United States of individual shops, restaurants, and small offices which all have their own parking lot. Set-back and yard zoning requirements also accentuate the discontinuity from one building to

the next. These commercial strips are actually a big cause of traffic tie-ups that plague suburbia all across America (Barnett, 2001).

Sadly, zoning laws continue to encourage middle and upper middle class families to move away from city centers to the suburbs, which in turn, continue to increase the number of minorities and poor families that remain in urban areas that continue to have declining economies and increasing crime rates. Examples of this happening can be seen in most major metropolitan areas; the suburbs tend to be affluent and mostly made up of white residents while the urban centers tend to be dilapidated and mostly inhabited by minorities and the poor (Barnett, 2001). As the affluent leave these urban centers, the tax base is decreasing leading the quality of schools to decline, crime rates to increase, green spaces to shrink, and infrastructure to be neglected, which in turns leads to even more flight (“Population Growth and...” n.d.).

The problem of continued urban sprawl growth is due to Americans wanting to continue to move to the suburbs. Recent studies have shown that 83% of American citizens preferred to live in the suburbs in a larger home far away from most commercial areas, than in a condo or apartment in the central areas of cities which would place them closer to shopping, work, and public transportation (Downs, 2004). Although many do agree that condos and apartments are quite adequate if located close to public transportation, they prefer to get as far away from work as possible; home is seen as the place that offers them a reprieve from work. The lack of backyard space for pets and children also concerns many people who have a choice between living in an urban center or suburbia. This is why most prefer to live in the suburbs (Madsen, 2001), even if suburban homes tend to be unsuitable for small families (Barnett, 2001).

Urban sprawl has led to a higher demand for automobiles, which in turn has led to the creation of the American idea that automobiles are the only way to get around a community even if alternatives exist. This belief continues to add to the increase in traffic congestion that plagues all of America's metropolitan areas and lead to the failure of public transportation in many cities. The problems mentioned in the above paragraphs have led to new movements in urban development, and a greater attempt to promote public transportation in America's ever growing metropolitan areas.

Traffic Congestion

Traffic congestion is characterized by cars traveling at lower speeds, increased queuing, and longer trip times. Traffic congestion occurs when demand is greater than the capacity of the roads in existence, which is a fairly common thing in most American communities ("Traffic Congestion," 2007). As metropolitan areas continue to expand without implementing public transportation reforms, the automobile becomes even more of a primary means of transportation.

As the populations of American metropolitan areas continue to grow, they continue to swamp the existing infrastructure's capacity. In fact, automobile growth in the United States is actually higher than that of population growth. From 1980 to 2000, 1.2 vehicles were added per every 1.0 person added to the population of the United States. Major reasons for this growth are the increasing wealth of most Americans, more affordable automobiles, relatively cheap gasoline prices in the past, and the fact that automobiles are necessary to get around most American metropolitan areas due to urban sprawl (Downs, 2004).

Traffic congestion's many negative side effects range from wasting the driver's time, to creating an economic loss. According to the Texas Transportation Institute, Americans sat still in traffic for about 3.6 billion hours in 2003. This can be equated to 55 eight-hour workdays a year spent behind the wheel (Arapkiles et al, 1998). This amounted to about \$67.5 billion in lost productivity, or about 0.7% of the United States' Gross Domestic product, or GDP ("Traffic Congestion," 2007). Commuters that have commutes lasting longer than 60 minutes grew by almost 50% between 1990 and 2000, according to Census Department data ("Despite cost of gas...", 2007). The loss in economic productivity is not only due to the idle time, but because traffic congestion can result in tardiness for many individuals reducing company revenues and also can lead to disciplinary action for these tardy individuals ("Traffic Congestion," 2007).

These aren't the only economic impact of traffic congestion as individual motorists must fix their automobiles more often due to the wear and tear of the frequent acceleration and braking common of most traffic congestion situations. The wear and tear leads to more repairs and replacements of automobile parts costing the individual a fair amount of money for maintenance ("Traffic Congestion," 2007). Mental health can also become an issue due to traffic congestion. Traffic can lead to increased stress due to the frustration of being stuck in traffic which then can lead to road rage ("Traffic Congestion," 2007). I have experienced this first hand as well as friends and family.

Road rage can become dangerous and in extreme cases has led to the physical harm of some motorists by the individuals suffering from road rage. A recent study by AutoVantage, a Connecticut-based automobile membership club, rated the cities with the worst road rage according to a survey completed by its members. Prince Market

Research conducted the survey for AutoVantage by conducting a telephone survey between January and March of 2007 and asked more than 2,500 drivers who commute regularly in 25 major metropolitan areas. Miami, Florida was rated the worst, Boston, Massachusetts came in third, and Phoenix, Arizona came in 6th; the survey had a margin of error of plus or minus two percentage points (“\$%^#! Miami...,” 2007).

Traffic congestion also leads to increased consumption of imported oil as fuel is wasted in idling and the constant acceleration and braking associated with traffic. According to the Texas Transportation Institute's most recent estimate, it found that traffic congestion costs about 5.7 billion gallons of wasted fuel for a cost of \$69.5 billion in 2001 when loss of economic productivity is included (Burchell et al, 2005). The usage of the automobile as the main means of transportation also leads to 43% of total energy consumption in the United States and a whopping 33% of greenhouse emissions. If Americans used public transportation for just 10% of their needs, greenhouse gas emissions would be reduced by more than 25% of what would have been this country's target under the Kyoto Accord (Autler & Belzer, 2002).

According to a recent study, 87.9% of American's who commute to their place of employment use private vehicles. This means that there are countless millions of vehicles moving on America's roads at the same times of the day. The current road infrastructure simply cannot support this high volume of automobiles, thus traffic congestion continues to grow into a major issue in every metropolitan areas (Downs, 2004). On average, American's spent as much of their income (about 20%) on transportation as they spent on housing yearly in the 1990s. It varies greatly from areas with high density and good public transit in place to those that don't. In Honolulu and

New York City, the citizens only spend about 9% of their income on transportation; while in low density areas such as Houston, Atlanta, Dallas-Ft. Worth, and Phoenix, they spend up to 23% of their income on automobile transportation (“New Urbanism,” 2006).

The fact that the automobile is the most important form of transportation in the sprawled out areas of most cities, the poorest of Americans who usually cannot afford an automobile are being forced to remain in the city centers. This is because they have to either rely on public transportation or walking to get to work or anywhere else. This then tends to reinforce the idea that public transportation is for the less desirable members of the population in metropolitan areas that have poor transport and most depend on the automobile (Barnett, 2001) such as my home town of El Paso, Texas and my future home, Phoenix, Arizona.

The fact that Americans prefer to drive private vehicles in general is a major reason for the increasing traffic congestion problem. One reason for this is that most public transportation systems cannot efficiently serve low density communities. Private vehicles are considered more comfortable than public transportation, faster, more private, easier to plan trips with, and most importantly, private vehicles allow greater flexibility when doing multiple tasks in one trip, than any form of public transportation can offer (Downs, 2004). This point is easily made by David Harris, a 31-year-old film school marketing manager in Los Angeles who commutes 40 miles a day for work said, “It’s a little inconvenient for me to take the bus (“Despite Cost of Gas...,”2007).” Even with gas prices so high nowadays, Americans still continue to use their automobiles because of the convenience and flexibility. Fadel Gheit, an energy analyst at Oppenheimer & Co.

recently said, “People complain about higher oil prices...but they still drive their cars, they still buy their SUVs, they don’t want to carpool (“Despite Cost of Gas...,” 2007).”

Traffic congestion is the by product of urban sprawl and it is an issue that should be dealt with soon. American’s being dependent on the automobile due to the urban planning ideas that caused urban sprawl, does not help the cause of getting them to use public transportation instead of the automobile in most cities. The increase of automobiles on the road only tends to aggravate the situation and ultimately leads to the negative effects caused by traffic congestion. These effects range from economic, environmental, to mental. Communities all across American now all agree that traffic congestion is a serious problem, but most solutions such as increasing road capacity and using technology to warn motorists of up coming traffic are not solving the core of the problem. The core problem is that American’s must stop their dependence of the automobile and the communities must provide them with an adequate public transportation as an alternative.

CHAPTER 3

WHAT IS BEING DONE TO FIX THE PROBLEM?

The fact that the federal government has not done much to help with the problem of urban sprawl nor that of traffic congestion, states and local municipalities are now taking charge to fix these problems. As state legislation becomes necessary to manage metropolitan growth, and techniques are tried to win political acceptance in some states, it has become easier to convince other states to take the political risk of passing legislation to control urban growth. Currently, fourteen states now have growth management legislation, with Hawaii being the first to enact legislation in 1961, and Pennsylvania being the most recent (Barnett, 2001).

The state of Oregon was the first state to require that each metropolitan area set specific urban growth boundaries and to delineate areas around a city or a town where new development should take place over the next twenty years. Publicly financed infrastructure to support development can only be constructed inside these boundaries (Barnett, 2001). Portland, Oregon created the Portland Metropolitan Service District which is an actual regional government that has adopted a regional plan that will accommodate predicted population growth primarily by intensifying development along rapid transit lines rather than expanding the growth boundary, which has only grown 7% from the first set limit. This has produced substantial reinvestment in older areas where infrastructure already exists, as well as limiting construction of new infrastructure outside the growth boundary (Barnett, 2001).

Zoning laws are being improved by changing them so that commercial strips can enlarge into commercial mixed-zones at key intersections that can become the equivalent of traditional town centers where people can park once and walk between destinations (Barnett, 2001). In some places such as in Arlington, Virginia, these districts are big enough to be served efficiently by buses and other types of public transit (“Transit-oriented Development,” 2007). Some new zoning laws are creating business improvement districts in their urban cores, helping to revitalize these areas (Barnett, 2001).

Others issues that once prohibited redevelopment of abandoned areas in metropolitan centers were that federal and state laws deterred (and still do) potential buyers from developing areas by exposing them to strict retroactive liability for the cost of remediating past ground and water pollution problems. Some of these areas are considered official brownfields, which are areas that are considered to be environmentally damaged by pollution of any sorts (Barnett, 2001).

In 1980, Congress enacted the Superfund Law which now requires that the parties responsible for the polluting pay for the clean up of the area. Congress also created a special tax incentive in 1997 that permitted developers of brownfields in economically depressed areas to deduct the cost of remediation as an ordinary business expense rather than having to add it to the cost basis of their property. The Environmental Protection Agency has estimated that this decrease in after tax remediation might stimulate up to \$6 billion in revitalization, and return as many as 14,000 properties back to economically productive use (Barnett, 2001).

Besides using the smarter methods of urban planning to help stem the increasing traffic congestion problems, cities are beginning to enact other ideas to help alleviate the problem. Aside from increasing the number of roads with new construction, cities such as Seattle, Washington are providing such novel things as providing ramp-metering which lets vehicles gradually enter expressways. Other cities such as Houston and Boston are creating High Occupancy Vehicle Lanes which are commonly known as the Carpool Lanes. HOV lanes are not perfect because they often are not properly enforced, at times lead to increased traffic congestion, and usually take a lane out of service from the existing roadways (Downs, 2004).

Using Urban Development

As mentioned in the preceding section, cities are utilizing many methods of urban planning in an attempt to fix the problems from the past. One idea of thought that is now being greatly considered is that of New Urbanism. New urbanism is a movement that is attempting to reform all aspects of real estate development and urban planning (“New Urbanism,” 2006). This school of thought, though popular, still has many critics.

New urbanism’s popularity increased in the beginning of the 1980s. The movement aims to create neighborhoods that are walk-able and designed to contain a diverse range of housing and jobs. It fully supports regional planning for open space, appropriate architecture, and a balanced development of jobs and housing. The aim of the movement is to reduce the time that people spend in traffic, to increase the supply of affordable housing for minorities and the poor, and to ultimately reign in urban sprawl.

This type of movement is also known as transit-oriented development (“New Urbanism,” 2006).

Transit-oriented neighborhoods usually have a center in which a tram/bus/train or metro station is located and is surrounded by relatively high density developments that progressively become less dense the farther you get from the center. The high density development is normally located within a radius of no more than a half mile from the transit focal point; this is because this distance is considered to be an appropriate scale for pedestrians. These features often encourage the use of public transportation because of the convenience and the lack of parking available in the area (“Transit-oriented Development,” 2007).

Transit-oriented developments usually feature mixed-used development that will utilize public transit at all times of day, provide excellent pedestrian facilities such as high quality pedestrian crossings, narrow streets, and the tapering of buildings as they become more distant from the transit hub. Mixed-use development is when there is more than one type of use in a building or a set of buildings, such as housing, retail, and office space. When zoning of an area is concerned, mixed-use development means that a combination of residential, commercial, industrial, office, institutional, or other such uses are included in the area (“Mixed-use Development,” 2006). A very recent example of transit-oriented and mixed-use development is that of the North Point Development in Cambridge, MA. It is located in an area that was underutilized, but will now be developed to include a central park, residential units, retail and office space, that will total several million square feet of development (personal communication with Benjamin Newlin, December 2005).

Mixed-use development was the most prominent style of development throughout history; from ancient times up to the 20th Century, which can be seen in the New York City area. This type of development fell out of favor during the industrial age in the 19th Century due to the pollution created by the factories. With the introduction of the Euclidian zoning laws, mixed-use development was no longer a pursued method of development (“Mixed-use Development,” 2006).

Many critics point out the fact that mixed-use developments are considered to be better suited for those who prefer public amenities to private regulated personal space. These type of developments most always lack yard space for children and pets, turning off many Americans. Mixed-use development is also considered to be risky by developers and lenders because all aspects of the development need to succeed and remain in business, if the overall development is to succeed. The Prudential Building Complex is a great example of Mixed-use development. Mixed-use developments are also costlier than single use suburban developments. In urban areas, mixed-use developments can cost up to 50% more to build than building the same amount of space in the suburbs, in part due to the higher cost of construction in urban centers due to the difficulty of bringing in construction materials (“Mixed-use Development,” 2006).

Some individuals argue that new urbanism ideas, such as transit-oriented and mixed-used developments, are robbing Americans of their civil freedoms to property rights and free flowing traffic. They claim that these types of developments are trying to force the American populace to give up these freedoms by being told how to live. This is the most extreme cases that are stated, but one can see how people seemed threatened when the vision of the American Dream is called into question. As mentioned earlier, the

American psyche was created by decades of bad urban planning and the belief that urban sprawl was the way it was and should be. People tend to be afraid of change and it seems that people who use this argument are simply afraid of change.

Others claim that new urbanism ideals are really only corporate greed masked to seem socially responsible. They claim that greed is forcing developers to attempt to gentrify urban areas with these types of developments by forcing out the low income citizens in order to attract more affluent residents. Some critics even claim that this type of thinking elevates aesthetics over practicality (“New Urbanism,” 2006). I disagree with the claim that aesthetics are being elevated over practicality, but can see how people may feel that new urbanism ideals are really about making money. I do not deny that real-estate developers are trying to make money from each development, but they are also the individuals that are spending the money and taking the risk. Many lose millions of dollars if developments fail, and many make millions if they succeed, but one must realize that if these developments succeed, then an area once dilapidated has been refurbished and increased the city’s tax base. The problem of gentrification is a serious issue that must be addressed when attempting to redevelop dilapidated areas.

Although cities are now taking charge in trying to stem the problem of urban sprawl and traffic congestion, it is not without its critics. The fact that only fourteen out of fifty states have urban planning legislation shows that the American psyche of owning one's own car and house with a white picket fence in the suburbs is still deeply engrained. It will take decades of hard work by state and local governments to change this way of thinking.

Using Public Transportation

Many cities are currently pursuing public transportation as an attempt to fight the traffic congestion problems that plague them, and trying to make it convenient in order to make it successful. Public transportation comprises all transport systems in which the passengers do not travel in their own vehicles, but rather in a regulated common carrier which is configured to provide regular service on a fixed route on a non-reservation basis (“Public Transport,” 2007). Rapid Transit, which consists of subway, underground, tube, and an elevated transit, is a railway usually in urban areas with the capacity for frequent service, and grade separation from other traffic. It is a rail-based transportation system that should be urban, electric, independent from traffic, and run with high frequency (“Light Rail,” 2007).

Cities that have a very convenient transit such as London, Moscow, New York City, Madrid, Paris, Hong Kong, Seoul, Tokyo, and Osaka, are the only cities in the world where the residents use public transportation as the primary means of transportation. In America, one third of the Americans that use public transportation live in New York City. Cities such as Phoenix, Los Angeles, Atlanta, Charlotte, Dallas, Las Vegas, and Houston depend so much on automobiles, that they have partial and/or poorly used public transportation systems (“Light Rail,” 2007).

Most public transportation systems generally rely on government subsidies to supplement income from fare collections, though some are run as unsubsidized commercial enterprises, or are fully funded by governments. Some systems also earn income through such means as unused real estate in the form of parking fees, leasing space to shops and vendors, advertising, and rights-of-way to carry fiber optic

communication lines. In the United States, the Federal Transit Administration which is an agency of the U.S. Department of Transportation administers programs that provide funding and support services to state and local agencies that operate a wide range of transportation services (“Public Transport,” 2007).

Cities tend to fund public transportation infrastructure in order to promote business and economic growth or in order to regenerate deprived areas of a city. It is the hope that by building a transportation system through dilapidated areas, then it will lead to mixed-use type of developments which will transform areas close to the transportation system. This can be seen happening as well at North Point in Cambridge, Massachusetts. Some city governments feel that this investment will ultimately save taxpayer money in other ways such as alleviating the costs associated with traffic congestion, road construction, and environmental damage due to having fewer cars on the road (“Public Transport,” 2007).

Public transportation is not without its critics though. Many critics of public transportation state that it is overly expensive and ineffective. One mistake with many of these arguments is that critics compare many new transportation systems to older, far more developed systems. Most compare these systems to New York City’s, Boston’s, or Chicago’s which are very developed and in high use (Litman, 2007). You can’t expect that Phoenix’s mere twenty miles of light rail will move the same number of individuals as New York City, a city well over ten million, compared to Phoenix’s three million or so. Since 1990, light rail ridership has nearly doubled from 175 million users to 336 million users in 2001. Eleven out of twelve new rail systems built after 1980 in the

United States have added new lines due to increases in demand (“What Critics are Saying,” n.d.).

The argument that cities inflate expected ridership numbers in order to secure funding, were once based on fact, but now have no real merit. When the communities across the United States started building new light rail systems after the 1970s, there was no real data to draw on due to the lack of light rail systems in existence; this led to over inflation of passenger numbers. Now, the Federal Transit Administration has improved oversight and provided actual data that has led to proper estimation of expected ridership for new systems. Salt Lake City’s TRAX light rail was expected to carry about 14 thousand riders weekly, but within a month of opening, it was carrying 19 thousand on weekdays (“What Critics are Saying,” n.d.).

Another argument used against public transportation is that it is heavily subsidized. Local critics of public transportation site how in 2003 U.S. transit operators obtained only 32.6% of funding from the federal government, which meant that most costs were paid by state and local governments (“Public Transport,” 2007). Even so, all public transportation funding only accounts for around 20% while the remaining 80% of federal and state funding is for roadways (“What the Critics are Saying,” n.d.).

Opponents also argue that the per mile construction and maintenance costs of constructing a subway or light rail line often equal or exceed that of an urban freeway, yet do not divert the same number of automobiles off the road (“Public Transport,” 2007). Although this argument can be true, opponents use skewed information to make their point. The main skewing of information occurs when opponents use actual public transportation ridership numbers compared to theoretical road capacity maximums. If

opponents were to compare apples to apples, they would see that for roads to carry the same number of people possible on a six car light rail, it would take a 12 lane freeway going in one direction to achieve the same passenger movement in automobiles as would be moved in this light rail. These opponents also leave out the fact that even if new roads are built, they quickly fill up to capacity and thus only reduce traffic congestion 1/11th of a percent for every one percent of new roadway built (“What Critics are Saying,” n.d.).

Some peoples concerns are that public transportation systems attract ‘undesirable elements’ and violent crimes on passengers and the homeless that sleep in train stations or the trains themselves. The reality, though, is that most transport systems are actually well-patrolled and generally have low crime rates (“Public Transport,” 2007). This view is also skewed in that many Americans have the perception that public transportation is only for the poor and criminals, thus building it will only lead to rises in crime. I partly feel that this is the racial and stereotypical feelings that many Americans might harbor without even realizing it.

Some people are not complete opponents to public transportation, but they are opponents to light rail. They suggest that the money should be spent on increasing bus service because it is cheaper and light rail costs too much and only affects a small area. Actually, buses cost more per passenger mile than light rail does. On average, passenger miles for buses cost \$0.55 while light rail passenger miles cost \$.045 (“What Critics are Saying,” n.d.). Part of the reason is that 80% of public transportation costs are related to operation. Buses normally carry about 100 thousand passenger for every employee at work compared to 206 thousand for light rail and 294 thousand for subway. Opponents of light rail often cite the high cost associated with building light rail systems which

range from \$10 to \$30 million per mile, while buses cost about \$1 to \$8 million to begin (“What Critics are Saying,” n.d.). There is no denying the high cost of building light rail, but the figures above show that light rail is a cheaper alternative in the long run and far more efficient than any bus system. One problem with building light rails that must be addressed is that often when light rail systems are built, the bus services suffer, defeating the purpose of building light rail to promote public transportation. If bus services are reduced, it tends to affect the communities negatively and actually reduce the attraction to the light rail by the commuters. Solutions to this problem can be as easy as providing separate operating budgets for the light rail system and bus system to ensure that neither suffers due to the other (Johnson, 2006).

Public transportation, in my opinion is the solution to many of the traffic congestion problems that cities face in America. In fact, surveys done by various organizations show that 66% of Americans feel that improving public transportation will lead to solving the traffic congestion problem (“What Critics are Saying,” n.d.). I think it will ultimately be a solution to ease urban traffic congestion, help stem urban sprawl, and reduce greenhouse emissions. Public transportation definitely has its critics, but my goal is to show that it can reduce traffic congestion when the other factors that affect urban sprawl and create traffic congestion are modified to promote it. Simply implementing a new public transport by itself will not lead to a reduction in traffic congestion. Instead, zoning and development laws should be amended in order to promote the growth of public transportation in conjunction with improving the convenience and attractiveness of public transportation itself.

Organizations Taking Up the Cause

As the issues of urban sprawl and traffic congestion become larger and of more concern to the average American, organizations are beginning to take notice and to advocate for smarter growth and public transportation. In fact, a survey by the Pew Center for Civic Journalism found out that urban sprawl ties with crime as a top local concern for most Americans (“Population Growth and Suburban Sprawl...,” n.d.). This is quite surprising, but at the same time shows that this subject that I chose for my synthesis is very important and the average American should begin trying to become more involved.

One of the organizations that I found could help the average American become more involved in trying to solve urban sprawl, fight traffic congestion, and promote public transportation is the Sierra Club. It is an organization that was begun on May 28, 1892 that was originally meant to explore and protect all wild places on earth. It is aiming to promote the responsible use of earth’s ecosystems and resources and to educate and enlist humanity to protect and restore the quality of the natural environment. This has led the Sierra Club to begin becoming an active participant in fighting urban sprawl and promoting public transportation and smart development. They use all lawful means to carry out objectives and have many chapters across the country where everyday citizens can join and begin the fight of traffic congestion and urban sprawl (“Inside Sierra Club,” n.d.).

The Sierra Club also gives several suggestions so that the average citizen can have a voice in their communities’ urban planning ideas. They suggest that the average citizen chime in by attending public hearings regarding urban planning projects, to write

to their local, state, and national representatives voicing their concerns regarding urban sprawl and its side effects, and to write letters to the editor of their local newspapers when they disagree or agree with city plan as an effort to promote dialogue and discussion amongst the citizens of their cities (“Stop Sprawl: What Can...,” n.d.).

Another organization that I felt was very helpful in educating me about public transportation is that of the Center for Transportation Excellence. I think it does a fantastic job of educating the average citizen as well as being an amazing resource for my project and all civic leaders attempting to promote and introduce public transportation projects in their cities. The Center for Transportation Excellence is a clearing house for information that supports quality transportation choices. It is committed to defending the merits of public transportation and equipping local leaders with the information they need to successfully promote and implement their transportation initiatives. The organization creates case studies that illustrate the power and effectiveness of public transportation. They also develop tool kits to help local leaders in communicating the benefits of public transportation programs, as well as mobilizing in response to media coverage of opposition to public transportation by writing letters to the editor to counter opponents’ arguments (“About Us,” 2006)

These are by no means the only organizations that are fighting urban sprawl, traffic congestion, and promoting public transportation, but they helped me further understand the complexity in solving traffic congestion and urban sprawl by utilizing public transportation and smart growth urban planning. Realizing that there are organizations willing to help everyday citizens not only show that this issue is coming to

the forefront in urban planning cases, but that the average citizen is becoming concerned with the issues and want to get involved in being part of the solution.

CHAPTER 4

A LOOK AT METROPOLITAN PHOENIX, ARIZONA

This chapter will take a look at the city of Phoenix and some facts in order to aid me in understanding its current situation, its past, and its future plans. Having grown to understand the history of urban sprawl and traffic congestion and its proposed solutions using urban planning and public transportation and their complex relationship, I will now begin to use this knowledge to find solutions that I feel the city of Phoenix and surrounding communities can use to make public transportation a success and thus reduce traffic congestion. This chapter also helped me better understand my future city as I begin to set my career plans in motion.

Metropolitan Phoenix, Arizona

Phoenix, Arizona is located in the Sonoran Desert which encompasses most of the Southwestern area of the United States. Because of its desert location, Phoenix only receives an average of 8 inches of rain a year, meaning that the city relies heavily on water from very far away. Being limited to and reliant on water from very far away is a major hurdle to sustain continued growth. According to Pat Gober, a professor at ASU in Tempe, AZ, "Phoenix has an economy and a political structure that is built on growth; so once it starts rolling, it just keeps on rolling" (Price, 2006).

The population of the Phoenix Metropolitan Area is estimated to be 3.9 million making it the 14th largest in the United States. Metropolitan Phoenix has been

experiencing exponential growth since the 1950s. From 1950 to 1970, the population in Greater Phoenix grew 300% and land area increased 630% (“Population Growth and...,” n.d.) From 1980 to 2000, the population grew about 132% and grew about 50% in land area (“Phoenix, Arizona,” 2007). See Appendix A for a map of Metropolitan Phoenix.

Due to this high growth, Phoenix suffers heavily from traffic congestion on all of its major roadways. Time spent in traffic in the Phoenix-Mesa area has increased at rates similar to that of Los Angeles. A study done by the Texas Transportation Institute in conjunction with Texas A&M showed that time spend in traffic increased from an average of around 1.2 hours a day to 1.6 hours a day from 1982 to 2000 (“Traffic: Traffic Time Index,” 2002). This accelerated growth along with problems of water usage, climate change, and urban decay are only being amplified by Phoenix’s desert location (Price, 2006).

Phoenix has urban planning issues due to a culture of migration, where a large percentage of the population comes from other places. This in turn contributes to disparate ideas about growth policy in each city and town in the metropolitan area. An example of this is that of the senior citizen communities of Sun City, Youngtown, and Sun City West which withdrew from their respective school districts so that they no longer had to pay taxes to those districts. The older citizens of these communities did not feel that they should pay for the education of other communities’ children. Senior citizens in the metropolitan area also regularly vote against metropolitan initiatives for transportation expansion and upgrades (Price, 2006).

In order to stem the uncontrolled urban sprawl growth for which the city had become known for, the State of Arizona passed legislation in 1985 which required that

the City of Phoenix create a General Plan. On October 2, 1985, the city of Phoenix adopted their first General plan that was to be updated annually (Phoenix Planning Department, 2006). The plan originally consisted of ten elements that the city would follow, but the General Plan was amended in 2002 to expand its focus on the environment and natural resources (Phoenix Planning Department, 2007). The General Plan elements are formatted to include goals, policies, and recommendations; it reflects both what the city would love to achieve over the years and what has actually been accomplished (Phoenix Planning Department, 2007). See Appendix B for a General Plan overview.

The General Plan can only be amended by various specific groups. Amendments can be proposed by a village planning committee, two members of the planning commission, by a city council member, or by owners of property in cases of land use map changes. In 2000 the Arizona State Legislature adopted the Growing Smarter Plus legislation which was a stronger version of the 1998 Growing Smarter Legislation (Phoenix Planning Department, 2007). This legislation added the Growth Area, Open Environmental Planning, Cost of Development, and Water Resources elements which were ultimately approved in 2002 by the City of Phoenix Planning Department, only after conducting an extensive involvement plan to get community input from 1999-2000. Over 2000 households were contacted directly via telephone to participate in a survey, flyers were placed in utility bills, a tabloid was placed in the Arizona Republic summarizing the new draft of the General Plan, presentations and mailings to community groups throughout the city, holding three open houses, having the city village committees

review the plan changes, and ultimately holding ten public hearings (Phoenix Planning Department, 2007).

Along with smart growth planning, the General Plan addresses the issue of public transportation which has historically been very inadequate for a city the size of Phoenix. The uncontrolled urban sprawl has not allowed public transportation to keep pace, thus adding to the problem of Phoenix residents continuing to use their private automobiles over public transport. Throughout most of the 1990s, Phoenix was the largest metropolitan area in the United States that had transit service only operating on Monday through Saturday without any Sunday or Saturday night service. This only began to change in 2001 with the expansion of service to Sunday in Phoenix, Glendale, and Scottsdale (“Valley Metro (Phoenix),” 2007).

Public transportation in the Phoenix Metropolitan area is run by the Regional Public Transportation Authority (RPTA) which is known as Valley Metro. Valley Metro is responsible for providing public transit in the Phoenix Metropolitan area and all of Maricopa County (“Valley Metro (Phoenix),” 2007 & “Phoenix, Arizona,” 2007 & “About Us,” 2006). In contrast to the MBTA which runs all bus service and subway service in the Boston Metropolitan area, Valley Metro does not actually operate the majority of transit services in the region. It is considered a membership organization in which most services are separately funded and operated by the individual cities and suburbs in the Greater Phoenix area that belong to Valley Metro. These cities agreed to participate in Valley Metro as a unifying brand to streamline service and to reduce confusion amongst riders (“Valley Metro (Phoenix),” 2007 & “About Us,” 2006).

The RPTA was formed in 1985 as a result of Phoenix area voters approving a one-half percent sales tax increase for a long-overdue expansion of the local freeway system and for an expansion of mass transit, which was sorely needed. The RPTA did not begin operating under Valley Metro until 1993 when the board of directors chose the name, the logo, and color scheme. In 2004, Proposition 400 passed which extended this half-cent tax to include a ‘SuperGrid’ bus service, bus rapid transit, and light rail. The ‘SuperGrid’ bus service currently has a travel frequency of about 15 minutes (“Valley Metro (Phoenix),” 2007 & “About Us,” 2006).

The Phoenix Metropolitan area mostly relies on bus service for its public transportation. Valley Metro operates bus routes around the Phoenix area through private companies based in Phoenix, Mesa, Tempe, Glendale, and other parts of Maricopa county. Bus routes are fairly easy to understand as the routes are numbered roughly according to the streets on which they travel. The buses operate from about 5a.m. until at least 10p.m., with some in operation until 1a.m. in the city of Tempe. The Bus Book, which lists all the bus routes, is updated twice yearly. It is about the size of a medium-sized catalogue of around 250 pages and can be found at Valley Metro ticket offices, public libraries, community colleges, civic facilities around the metro area, online, and on the buses themselves. Customers can also call a toll-free number where a live operator will help them plan out their journey (“Valley Metro (Phoenix),” 2007).

Valley Metro also coordinates Rideshare, which is a vanpool and carpool service that is often organized through employer group programs. This is one of Valley metro’s most used services, though it does not garner much attention (“Valley Metro (Phoenix),” 2007).

It is evident that the citizens of the Phoenix Metropolitan area are currently forced to rely on private automobiles due to the inconvenient and inadequate transit service. Past uncontrolled growth is now being addressed by the recently amended General Plan which is also attempting to address the public transportation issues that the Metropolitan Phoenix area is facing by utilizing planned growth, zoning, and smart development in order to make public transportation more convenient and reliable.

Phoenix's General Plan: A Critical Look

The first element of the City General Plan is that of Land Use. This element discusses the type of land uses that are needed in the city, and how they should be arranged. The land use portion of the plan can be considered the city's zoning laws. The city of Phoenix tries to follow the Urban Village Model, which currently has designated the city of Phoenix into 14 existing villages. The Urban Village is divided into five components which are the Core which consists of a central focus with a pedestrian friendly mixed-use land usage, residential neighborhoods, community services areas, regional services areas, and open space (Phoenix Planning Department, 2006).

This element is a good start, but it still has the signature of urban sprawl in that it still advocates the separation of the residential areas from the commercial and jobs. Although the city is being zoned into 'villages,' each village is not being conducive to the promotion of public transportation. Separation of the five village areas will still require that citizens in these villages depend on their automobiles to get from one place to another. Although the zoning of the separate areas is meant to keep each village manageable and in a sense self sufficient, it is not addressing the problem of traffic

congestion nor is it advocating higher density in order to promote the usage of public transportation.

The second element is that of Area Growth which was adopted in 1998 in response to acknowledging the uncontrolled growth of the city. This element attempts to understand the growth of the city itself and to maintain the quality of neighborhoods and maintain a viable economic base. The key concepts of this element are making sure the location of employment growth is where it is needed, that residential growth is in the correct location, managing the finances of infrastructure properly, preserving open space and the desert, creating infill housing, capturing public revenues, targeting growth of areas, and providing proper transit and transportation planning. (Phoenix Planning Department, 2006)

The major concern that I find with the Area Growth element is that it does not attempt to stem the growth of the city. It addresses great concerns such as creating smart growth and making sure that the surrounding natural areas are preserved, but it doesn't do much to increase the density in the existing areas. It also addresses making public transit available to the new areas, which is great because they are attempting to get people to use public transport, but it does not go far enough. The element of area growth doesn't go far enough because it is not making public transportation more convenient for these new neighborhoods, which will probably keep ridership at the same level it currently stands. This element is a start as the city is trying to control the uncontrolled random growth that resulted in the urban sprawl that Phoenix currently suffers from, but it does not attempt to reduce the expanding growth the way it should.

The next element is that of the Cost of Development, which requires that the city make the developers of new developments pay for their 'fair' share of the cost of new city facilities. These facilities include such things as water and sewer lines, transmission lines, parks, fire stations, major streets, libraries, and the preservation of the desert (Phoenix Planning Department, 2006). Although this is a great idea and a smart one, I would caution that the city does not impose too much of these costs on developers as it will discourage them from building necessary developments. I would suggest that the city of Phoenix offer incentives such as tax breaks for the developers that build city infrastructure when they develop an area. If developers go above and beyond what is required, the city should reward them with further incentives; this will usually motivate developers to take on the responsibility of building necessary city infrastructure without fearing the high costs associated with such facilities.

The element of Circulation is very important because it is an attempt to reduce traffic congestion. This involves increasing the size of existing streets as well as expanding the existing road system. It also makes sure that neighborhoods are protected from high speed and cut through traffic by ensuring that new roads can handle the high volume traffic. The element also tries to stem traffic congestion by ensuring that mass transit is available to all areas of the city, and by expanding the pedestrian and bicycle environment (Phoenix Planning Department, 2006).

This element is a start in the fight to stem traffic congestion, but it goes not go far enough. The fact that its main component is to increase the roads available for traffic, leads me to believe that the city really isn't doing anything different from before. It simply is repeating what was done before when the city grew; simply building new roads

does not ease traffic congestion in the long run. The element has a public transportation aspect, but it is not the main factor, which I feel is vital to truly combat the traffic congestion problem Phoenix faces. New money is necessary to keep roads in working condition and even increase as the population increases, but more city money should be spent on promoting public transport than automobile usage.

There is an element for bicycling, which tries to create programs that help reach the goal of increased bicycle access, ridership increase, and bicycle safety (Phoenix Planning Department, 2007). This is a great element to have as it not only promotes exercise, but the use of an alternate form of transportation which can help reduce the dependence on cars; although marginal, it can help ease congestion.

The General Plan element of Housing recommends ways to improve housing quality, variety, and affordability in Phoenix. Housing has increased 33% from 1995 to 2000, but little of that has been affordable housing. The element controls housing development, housing choices, special needs housing, fair housing, and it can determine what kind of housing is needed in each new development (Phoenix Planning Department, 2006). Although the city is on the right track in trying to ensure that all citizens have housing, it should also ensure that all new developments include affordable housing as is done in the city of Boston. The city should also make an effort to promote the building of mixed-use development housing and of building housing near transit points.

Another element is that of Neighborhoods, which is concerned with promoting strong, healthy neighborhoods which hope to preserve their unique characters. It aims to create new neighborhoods that are safe and well maintained as well as creating neighborhood organizations, maintaining or creating neighborhood character and identity,

and ensuring that there is enough neighborhood circulation with streets, sidewalks, and access to the freeway (Phoenix Planning Department, 2006). As long as the city attempts to promote more urban housing and the creation of transit-oriented development and mixed-use housing, it will create new healthy and vibrant neighborhoods.

The next element that the General Plan addresses is that of Conservation, Rehabilitation, & Redevelopment. This element is included in the Great Plan because it attempts to protect stable areas and rehabilitate those areas with deterioration. It aims to protect historic and cultural areas with property preservation, comprehensive neighborhood revitalization, elimination of deterioration and blight, and adaptive reuse of obsolete areas (Phoenix Planning Department, 2006). This aspect of the plan is very important as it leads to redevelopment of dilapidated areas, but without the promotion of higher density redevelopment and mixed-use and transit-oriented development, the city won't become friendlier towards public transportation.

The elements of Environmental Planning and Natural Resources Conservation are meant to promote community sustainability and viability as well as addressing flood protection, erosion protection, vegetation protection, and wildlife protection. These elements are also trying to restore air quality, the reclaiming of brownfields, energy efficient planning and design, green building, noise mitigation, pollution prevention and waste minimalization, recycling, and reducing the effects of heat island effects (Phoenix Planning Department, 2006). The Open Space, Recreation, and Water Resources elements are meant to ensure that there are open spaces left in all new developments as well as the protection of natural open spaces around the city and mountains beyond. The plan attempts to create new open spaces in new developments as well as in existing areas.

The General Plan tries to protect the existing water supply and aims to prepare the city for droughts and the increase in water usage, by implementing water conservation policies (Phoenix Planning Department, 2006). Safety, Public Building, and Public Services and Facilities elements are meant to ensure that city neighborhoods are safe, that government services are easily available to all residents, and that all necessary facilities are able to handle the expanding growth (Phoenix Planning Department, 2006).

The above mentioned elements of the General Plan are a great start for the City of Phoenix in trying to rein in uncontrolled growth and improve public transportation. Another major problem that I see with the plan is that it only addressed the issues of the City of Phoenix and not of the Greater Phoenix Metropolitan area which includes Scottsdale, Glendale, Mesa, and Tempe among others. Although these cities are attempting to emulate the General Plan of Phoenix, without one General Plan for the whole metropolitan area, the urban sprawl and traffic congestion problems will never be solved. I understand that there are several distinct cities and towns that compose the Greater Phoenix Metropolitan Area, but a plan should supersede these boundaries in order to ensure cooperation and success amongst all these sovereign governments in the Valley. By allowing each of these cities to create their own laws and plans without working with their neighbors, the problems of urban sprawl, traffic congestion, and inadequate public transportation will not be solved.

Phoenix's Public Transportation Plans: A Critical Look

Along with the General Plan for the City of Phoenix, the metropolitan area in general has begun to realize that due to the previous uncontrolled growth and resulting

traffic congestion problems, it needs to help solve these issues through investment in its public transportation system, along with smart growth and smart urban development.

The reason that public transit has been unsuccessful in the Phoenix Metropolitan area is because it covers many suburban areas that were not previously seen to be appropriate for high volume bus service, or light rail service. This has recently changed as the city begins to control growth, and areas become much more densely developed and populated. Long term plans from 2015 to 2020 now call for more buses on arterial streets, and to expand service until at least midnight and start service at an earlier time (“Valley Metro (Phoenix),” 2007).

Understandably the city had not developed great public transportation routes in the less densely populated areas, but if it continues to allow outward growth, a lot of these areas will not become as densely populated as they need to be in order to support light rail or rapid bus service. Although taking a step in the right direction by expanding the public transportation hours of service, it seems that by waiting almost a decade to implement, they aren’t grasping the importance of making public transportation convenient. Longer service hours would increase ridership as people who are unable to take public transportation due to the lack of hours of service would now be able to take it. Later service hours will allow people who go out and drink to stay off the roads and have a safe alternative to driving in order to get home.

With the General Plan’s ability to allow for higher density in the Greater Phoenix area, the planning of a light rail system has been an objective since the creation of Valley Metro in the 1990s. It was originally conceived to be an elevated transit line designated into three lines known as Val-Trans, but it was soundly defeated by voters in 1993, and

1997. It was not until the year 2000 that voters approved the construction of the light rail system (“Valley Metro (Phoenix),” 2007).

The light rail which is currently under construction will simply be known as METRO after a naming contest. METRO will consist of twenty miles of track that will service Phoenix, Tempe, and Mesa; see Appendix C for a plan of the METRO route. Construction began in March of 2005 and is slated to be completed by 2008, at an estimated cost of \$1.4 billion dollars. The light rail is slated to operate in city streets in a center reservation, that is similar to that of the Green Line trolley in Boston. The twenty mile route was planned to service the areas where public buses had the highest volume of users (“Valley Metro (Phoenix),” 2007 & “About Us,” 2006). It is a real smart idea to open the first light rail system along the routes of the busiest bus lines in my opinion. It will not only make it convenient to use for the individuals who currently use the bus system, but it will also attract newer customers as they realize that it is a clean and fast method of public transportation that will not have to struggle with daily traffic just like city buses currently do.

Valley Metro already has set up plans for future extensions of the METRO system. It is expected to be extended to reach the MetroCenter, a mall in Central Phoenix, as well as West to Glendale, to the Western Suburbs along Interstate 10, Northward to Paradise Valley Mall in North Phoenix along Route 51, from Arizona State University to Southern Tempe, further East into Mesa, and lastly, into Scottsdale running along Scottsdale Road. Studies are ongoing to find other eligible high capacity corridors for added service a few decades in the future. See Appendix D for a plan of the proposed

extension routes. The first extension is slated to open by 2012, although it is already falling behind schedule (“Valley Metro (Phoenix),” 2007 & “About Us,” 2006).

These extensions seem like a great idea and hopefully Valley Metro can ensure that these will be convenient and safe to use. I would only suggest that Valley Metro begin to attempt to make METRO connections to residential areas in the suburbs to begin promoting further usage of METRO and the public transportation in general. If METRO is only expanded to shopping centers and sports arenas, the regular daily commuter will have no interest in using it. Valley Metro needs to ensure that further extensions of METRO will begin to convince people to stop depending on their automobiles and instead begin using the METRO system or other means of public transportation.

Valley Metro hopes that the METRO will have a one-third farebox ratio when it opens, and anticipates it to rise up to 45% by the year 2025. Farebox ratio is the amount of total operating budget for a transit system that is supplied by fares (“Valley Metro (Phoenix),” 2007). I believe that this is a great goal by Valley Metro as it realizes that although many people will use the METRO, it will not be in such high volumes that the system’s operating costs would be supplied by fares alone. No public transportation system in the world is fully funded by fares alone. Although it will never have a fare box ration of 100 percent, Valley Metro should aim at increasing ridership by providing reliable and convenient service, and by increasing light rail awareness through smart advertising of the system.

METRO definitely has critics who oppose its very existence. The mayor of Scottsdale recently made it known that she opposes any light rail extension into her town, which is a very affluent town in the area. Republican U.S. Representatives Jeff Flake and

Trent Franks from Arizona have continued to oppose the light rail project claiming that it will not address any of the regional transportation needs, but merely that of Phoenix, Mesa, and Tempe. They and other interest groups would rather use the money to build more roads and highways; this is the reason the representatives keep attempting to kill the rail plan altogether. The representatives claim that light rail will not alleviate any traffic and that it will, in fact, increase the traffic in Central Phoenix and Tempe (Sunnucks, 2004).

I highly disagree with the critics who oppose METRO in general. I don't believe that METRO is completely the answer to all of the Greater Phoenix Metropolitan area's urban sprawl and traffic congestion problems, but it is a great move in helping this area become public transportation friendly. I disagree with US Representatives Flake and Fanks because the money should not be spend on new roads as it only will end up adding to the traffic congestion problems. It may alleviate congestion in the short term, but if they continue to advocate the usage of cars, the traffic congestion problem will only increase.

The mayor of Scottsdale is partly fighting a METRO extension into her city because of it destroying the city's beauty, increased crime because of the 'bad elements' that it can bring. This is fear mongering in that if Valley Metro and the city of Scottsdale work diligently at monitoring and protecting the stations, they should be safe and convenient for everybody to use. A great example of safe public transportation systems is that of Washington D.C. On a visit to DC a few years ago, I was amazed at how clean and safe the subway stations were. I think that if the cities work in conjunction with Valley Metro to keep the stations safe, it will not attract 'bad elements' as is feared. This

fear is mostly based on prejudices and stereotypes of public transportation that many of the affluent have.

If the light rail system is considered a success by Valley Metro and the cities of Phoenix, Mesa, and Tempe, it might spur more frequent service and even further suburban extensions. If Valley Metro is successful in getting Phoenix area citizens to begin abandoning their automobiles and start using public transport, then elevated rail service or even subway service might be installed; though these ideas have been rejected in the past. There is also a movement to begin regional rail service to other Arizona cities, although it is not being pursued with much vigor at the moment (“Valley Metro (Phoenix),” 2007).

CHAPTER 5

HOW TO MAKE PUBLIC TRANSPORTATION A SUCCESS IN GREATER PHOENIX

Taking into account the complexity of the subject, I have come up with multi-layered suggestions that I feel that City of Phoenix and the surrounding communities should adopt in order to combat the problem of traffic congestion and urban sprawl by promoting public transportation and ensuring its success. Simply improving and increasing the reach and convenience of public transportation will not work. I make suggestions of passing state or local legislation that will enforce smart urban planning which includes everything from urban growth boundaries, to transit-oriented development and mixed-use development, in order to promote and ensure the success of public transportation. I also make suggestions for legislation that the governments should pass in order to combat traffic congestion while promoting the greater use of public transportation.

Lastly, the public transportation system should also become an attractive alternative to the automobile and I make my suggestions for that as well. The synthesis project may simply be called 'Fighting Traffic Congestion in Phoenix, Arizona by Making Public Transportation a Success,' but that is far too much of a simplification as you have seen. In order for public transportation to help ease traffic congestion all parties involved should work together to make public transportation a success and an attractive alternative to the automobile.

Coming up with these suggestions not only required my understanding of the issue and the complexity in making public transportation a success, but also benefited

from suggestions from peers. I enlisted the help of several peers to understand what others felt were problems with public transportation, why they preferred the automobile if they did, and what they felt could be made better in order to make public transportation far more attractive to more citizens.

I met with five individuals, who consisted of two women and three men, on March 20, 2007 after work to have a dialogue in order to explore the problem and find possible solutions. These individuals consisted a wide arrange of careers such as lawyer, event coordinator/planner, architecture students, and architects; most importantly, they were also my close friends. In order to show my gratitude for their help, I treated them to dinner and then met with them at my former employer's office in one of their conference rooms. I was the facilitator of the dialogue and prodded them with questions in order to get the discussion going. I did not impose any of my ideas on them, but merely prodded them along with each of their ideas, which often matched my own.

Having performed this dialogue greatly helped me in shaping this chapter. I was able to assure myself that my ideas were feasible and had the backing of individuals with varying careers and opinions. This dialogue process also allowed me to understand what ideas I should further research and what to ultimately include in my suggestions. Hearing what the 'regular' person thought put the project into perspective and allowed me to make suggestions that most individuals could agree upon.

Using Smart Urban Planning and Development

One of the most and effective tools that can promote public transportation in the Phoenix Metropolitan area is that of smart zoning laws, smart urban planning, and

increased usage of transit-oriented and mixed-use developments. As noted above, Phoenix's General Plan is a great start, but falls short of promoting public transportation in order to ease the traffic congestion problem that plagues the area.

First and foremost, the General Plan should not just apply to Phoenix proper, but to all the cities and communities that make up the Greater Phoenix area. Although it is safe to assume that all these municipalities cooperate in their urban planning, the Arizona State Government should pass another law that makes the General Plan apply to the whole area. The State of Arizona has taken an interest in the City of Phoenix due to it being the seat of state government, but it cannot be short sighted and act as if the surrounding communities do not impact their city. Some may argue that the state has no right interfering in individual cities' affairs, but it can and has by passing legislation that affects the planning of the city of Phoenix. The legislature should now take the responsibility of applying that law equally to all municipalities in the state, especially the Metropolitan Phoenix area. Without this interference from the State, the individual communities have no real motivation to work together for the common good or recourse if they do not. The communities may attempt to work together towards the goal of fighting urban sprawl and promoting public transportation, but if at one point a difficult decision arises that requires one community to bare the brunt of it, then that community can just as easily say no and not have anybody to answer to. As I learned in my Introduction to International Relations course at Boston University; the role of governments is to protect their citizens and their interests, even if it means at the cost of other countries (communities in this case).

The Arizona State Legislature should pass legislation that affects the whole Metropolitan area as a whole if they are truly serious about limiting urban sprawl and promoting smart urban development. In passing legislation for a 'Region' General Plan, the legislature should also ensure that there are safeguards to ensure that the larger cities and communities do not disregard the needs of the smaller. I would recommend that the Arizona State Legislature pass legislation similar to that that the State of Oregon passed in 1973 which required that each community in the state create an urban growth boundary ("Urban Growth Boundary," 2006).

The urban growth boundary is a legal boundary separating urban land from rural land. Its purpose is to protect farms and forests from urban sprawl and to promote the efficient use of land, public facilities inside the boundary. It is also meant to motivate the development and redevelopment of land and buildings in the urban core and keep downtowns in business and allow for local governments to better take care of existing infrastructure and properly plan where to place new. Instead of spending money building new infrastructure as the city expands, they utilize the money to fix and maintain what is in existence ("Urban Growth Boundary," 2006).

Due to the legislation passed by the Oregon State Legislature, Metro established in 1977 is the agency responsible for managing the Portland Urban Growth Boundary. This agency has the power to coordinate between regional and local plans in adopting a regional growth boundary. They have the power to plan many activities that affect the city, such as transportation, water quality, air quality, and solid waster amongst others. Metro also encourages efficient land use by directing most development to the existing urban centers along major transportation corridors and promotes a balanced

transportation system within the region that accommodates bicycling, walking, driving, and public transportation. This is to achieve the region's goal of building complete communities by providing jobs and shopping close to where people live (“Urban Growth Boundary,” 2006). The General Plan of Phoenix sets the ground rules for these activities, but again, only in Phoenix proper and it has no real enforcement power as the General Plan are guidelines to follow and not an agency in itself that enforces them.

Although most individuals, including myself and such notable people such as former Vice President Al Gore, feel that Portland’s urban growth boundary is a great plan that is functioning properly and is a perfect model for cities to follow, it does have many critics. Many critics claim that urban growth boundaries are restricting and bad for business. One thing that should be pointed out is that Oregon’s Urban Growth Boundary legislation is not to be static, but can grow as needed. In fact, it has grown many times since it was established, most recently in 2004 when Metro added 1,956 acres in order to accommodate industrial companies that needed the space (“Urban Growth Boundary,” 2006). The purpose of urban growth boundaries is to promote higher density and protect rural areas, but at a controlled space. The legislation in Oregon requires that the boundaries include enough space for about 20 years worth of growth needs. This allows for stable and healthy metropolitan areas and thriving downtown centers, which is acknowledged by developers even though they complain greatly about Metro’s policies for urban growth (“Myths & Facts,” 1999). This does not restrict necessary growth and once the boundary is set and no more growth can be accommodated within the boundary, it can easily be expanded. The argument that it is restricted is quite inaccurate and in my opinion an uneducated one.

One of the most major arguments against urban growth boundaries is that it makes the region affected become less affordable and limits the people who can purchase a home (“Myths & Facts,” 1999). They tend to cite the National Association of Home Builders Housing Affordability Index which was supposed to calculate housing affordability based on median house prices. The index utilized incomes from the 1990 Census and thus showed that when Portland was on par with the national average in 1992, it moved to 94 and 190 on the list almost immediately. For about five years it remained as one of the most unaffordable places to live according to the Index (Langdon, 2005). The critics would argue that this was proof of how urban growth boundary legislation had made this city an expensive place to live, but then in 2003 it suddenly dropped to 65 on the list. This was due to the NAHB’s Housing Affordability Index was now using numbers from the 2000 Census meaning that it had been underestimating the yearly income of most Portlanders. In fact, Housing Policy Debate Journal also conducted a study in 2002 that found that prices had only increased in the first half of the 1990s, but then leveled out since (Langdon, 2005).

Critics also claim that the limit of land for construction is the cause of increased home costs. If this were the case, then unlimited land growth from urban sprawl would lead to an abundant supply of affordable housing. This, in fact, is not true for the simple reason that in places such as Los Angeles that has unlimited land out west for growth, has homes that cost about \$30 thousand more than in Portland, Oregon that has a limited growth boundary. Homes in Orange County cost an average of \$75 thousand more than homes in Portland (“Myths & Facts,” 1999). I acknowledge that comparing these

different size regions can lead to unfair comparison, but it does support the point that having unlimited land growth can also lead to increasing housing prices.

Although prices in Portland have increased partly due to the urban growth boundary methods, it has not entirely been because of the negative aspect of it. Deborah Howe conducted a study on behalf of The Portland Edge and she concluded that a major reason for the increase in property prices is because substantial investments had been made in housing rehabilitation and renovation because of the redevelopment. These homes tended to be in dire need of rehabilitation and thus were being sold for a below market price before being refurbished. After this substantial investment began to occur, these homes became more attractive and began to sell for their true value (Langdon, 2005).

Homeownership increased 1.6% among African Americans and jumped 6.95% among whites since the boundary was implemented. In fact, every age group except the 55-64 group increased its homeownership rate in metro Portland (Langdon 2005). The increase in housing is caused more by boom economics than a lack of land to build one. It can also be attributed to homebuilders building more expensive homes, but even then, housing and renting remains affordable to most citizens in Portland. Just as in most major cities, there is still poverty and this means that not all housing and renting units will be affordable to most citizens (“Myths & Facts,” 1999).

In order to address the potential problem of housing becoming unaffordable in the Greater Phoenix Area if urban growth boundaries are incorporated as I suggest, the city should do more to ensure that housing does remain affordable to all. The General Plan talks about trying to create housing for all citizens, but there is no hard legislation to

ensure that there are always available housing units for all. I would suggest that the city of Phoenix follow the example set by the City of Boston and the Commonwealth of Massachusetts.

The Commonwealth of Massachusetts requires that 10% of a community's housing stock be considered affordable housing (Sharatin, 2006). In the city of Boston, Mayor Thomas Menino launched a three-year housing strategy called "Leading the Way" in the fall of 2000 which is a comprehensive housing strategy to create 2,100 affordable units. He directed the city departments to sell vacant land for housing development and increased housing funding by selling surplus city buildings. By 2003, the city had created 2,217 affordable units and 3,142 at-risk federally subsidized units instead of the 3,100 target which made housing available to the homeless ("Affordable Housing," n.d.). The Boston Redevelopment Authority runs the programs proposed by Mayor Menino and, to ensure the compliance of the Commonwealth's requirements of 10% affordable housing units, by using public land and with the help of developers, it gives financing assistance and relief from regulation ("Affordable Housing. Boston," n.d). This type of regulation can be set forth by the State of Arizona and the local communities in the Metropolitan Phoenix Area.

The main reason that I am advocating the Urban Growth Boundary system for the Metropolitan Phoenix Area is that this will stop the problem of urban sprawl and thus will lead to higher densities within the area. The light rail system is currently only being placed in the area that has the highest bus transit usage because it is the only area currently dense enough to support the light rail system. The planned future extension will also reach into high density areas, but any further expansion of the light rail system

will require that the region become denser. Density leads to higher usage of public transportation as traffic congestion increases and parking spaces become less available due to the increased development. It may seem counter intuitive that I am advocating increasing densities in the region that could potentially lead to increased traffic congestion in order to combat that same problem, but as the problem becomes worse, motorists will find public transportation a more attractive means of transportation for most of their needs. A denser region also means that public transportation will become a more attractive option as it means that jobs, housing, entertainment, and shopping will all be close to transit areas. This close proximity of having everything close to transit can only be achieved through smart urban planning and the implementation of such development methods as transit-oriented and mixed-use developments.

The General Plan of Phoenix addresses the utilization of transit-oriented and mixed-use developments, but in my opinion, not effectively enough. Instead of trying to promote this kind of development in each of the 28 proposed stations and beyond, it is mostly advocating the use of the Urban Village (Phoenix Planning Department, 2006). The Urban Village model, as stated before, is simply a micro-version of urban sprawl. It is promising that they are thinking about creating communities, but they should think in smaller terms. They should be planning on creating new neighborhoods near each light rail stop in order to make it more convenient and attractive to people who live near them. If each light rail stop, and major bus stop for that matter, only has one 'attraction' it will only be used by a few, but when you create an area that has shopping, housing, entertainment, open spaces, and employment, then far more people will utilize these

transit stops due to the convenience of having everything within walking distance of a transit stop.

In order for transit-oriented development to be successfully implemented, it has to be attractive to all types of people and businesses in order to succeed. It also involves many entities such as state departments of transportation, transit agencies, municipal government, state and local legislatures, real estate developers, neighborhoods groups, and other business interests (Mangini, 2005). These groups all have different goals and definitions of project success or failure, but they should work together to reach a common goal that benefits all in the long term, and not only think of the short-term. Before these groups finalize plans for any transit and mixed-use development, they should forge an agreement on a functional definition of transit-oriented and mixed-use development, and articulate quantifiable goals and measurable performance standards by considering the impact of different choices and the outcomes of trade-offs (Autler & Belzer, 2002). The parties involved should establish plans around all transit stations and make sure to coordinate all actions with the transit operators, neighborhoods groups, real estate developers, local governments, and all other key actors.

Methods that can be utilized in Phoenix to improve the chances of successfully implementing transit-oriented and mixed-use development ideas involve having the governments, developers, and lenders work equally to attract the tenants and inhabitants. Due to the higher cost of developing this type of developments, the state and local governments should implement laws and educate lenders so that they will revise underwriting practices that are compatible with the goals of transit-oriented and mixed-use development (Autler & Belzer, 2002). Another method to attract these people to

these types of developments is to offer Loan Efficient Mortgages which allow people who live in these neighborhoods and spend less on transportation, to obtain larger mortgages than they normally would (Autler & Belzer, 2002).

There are many examples of success and different ways that the community governments in the Phoenix Metropolitan Area or the State Government can attract developers to develop such areas around the light rail transit stops and the main bus stops. It can create legislation that is similar to that passed in the State of Pennsylvania.

The Pennsylvania State Legislature passed the Transit Revitalization Investment District Act which authorized public transport agencies to work cooperatively with counties, local governments, transport authorities, the private sector, and Amtrak to create and designate Transit Revitalization Investment Districts. This is revolutionary in that it promotes government interaction with the private sector regarding developments and encourages transit-oriented and mixed-use development planning in a regional manor. The Districts should incorporate these types of developments around all major transit nodes, and eventually create new ones as growth continues. Cities and communities that are undertaking these types of developments receive priority consideration for planning and implementation of these projects and it even grants technical assistance (Mangini, 2005).

The city can also provide other incentives to promote these types of developments, even if legislation has been passed promoting them. Developers in most cities, such as Portland and Boston complain about the high cost of developing these types of developments and of the restrictions placed by city and other governments such as affordable housing requirements, environmental, and urban growth boundary

restrictions. For this reason, the community and state governments in the Phoenix, Arizona area should provide incentives such as speedy approval of these projects, and most importantly, tax incentives. Many will argue about tax incentives costing the local governments loss in revenues from taxes and that the profit of these developments only goes to a few wealthy individuals and companies and not the community at large, but I think that these individuals are being short sighted.

In Portland, Oregon, the city passed a transit-oriented development property tax exemption ordinance that gives developers of these projects a ten year tax break. This is not that great of a loss to the local governments as after the ten years have passed, property values will have most likely risen and the gain of new taxes will offset those lost in less than the ten years the city did not have them (“What Critics Are...,” n.d.). This should make people realize that tax breaks on these types of projects are more of an investment for the long-term success of the community than the short-term loss people argue about.

Although much of the immediate profit from these projects goes to the developers, the community ultimately benefits as well in the form of increased taxes and new infrastructure and economic activity. Even if the developers get a lot of the immediate financial benefits, they are entitled to it because they invested their own money and risked losing it. They also saved the tax payers money by building the infrastructure themselves instead of using taxpayer money to build private homes and business infrastructure. The community and city governments in the Greater Phoenix Area should see tax incentives and breaks as an investment that will pay off in the long-term, which is how most municipalities should think.

Transit-oriented and mixed-use developments will not take every car off the road and relieve traffic congestion completely, but it will reduce traffic congestion significantly by offering a more balanced set of transportation choices that include automobiles, public transportation, bicycling, and walking. In the city of Arlington, Virginia, transit-oriented development has led to 40% to 60% increase in the number of tenants in these developments that do not utilize automobiles on a daily basis (Autler & Belzer, 2002). As more and more transit-oriented and mixed-use developments are developed near the new Valley Metro light rails and major bus stops, then people will begin to utilize these alternate methods of transportation due to the increased convenience. This will in turn reduce traffic congestion, which is the goal of these types of developments, because people in these areas will need their automobiles less and less. Boston and New York cities are great examples of people utilizing their automobiles less and less due to the convenience of most everything needed, from jobs, homes, entertainment, and shopping, being within walking distance of the subway stops. Although part of what makes this possible in Boston is the lack of land area for new development, it is promoting more and more of these developments as areas near the subway stops are being redeveloped. The North Point Project in Cambridge and the Columbus Center Project in Boston mentioned earlier are great examples of this functioning.

Ultimately, smart growth with public transportation in mind will lead to a decrease in traffic congestion in the Phoenix Metropolitan Area for various reasons. By implementing urban growth restriction legislation, the densities will increase within these communities making public transportation in the form of light rail and high speed bus

services more feasible and successful. As the State of Arizona and the Greater Phoenix Area governments promote transit-oriented and mixed-use development, then transit stops will become more of a destination and in turn make public transportation more convenient and an attractive alternative to traveling by automobile, thus reducing traffic congestion. These indirect methods make public transportation more attractive, thus ensuring its success and reducing traffic congestion.

Improving Public Transportation

Once the groundwork has been set for the promotion of public transportation through urban growth barriers and the promotion of transit-oriented and mixed-use development, then one should actually ensure that the public transit itself is convenient and attractive enough to entice automobile driver to abandon their cars for at least part of the time. Valley Metro is on the right path with improvement of their bus service, and most notably the construction of the METRO light rail system. Although I feel that Valley Metro has been greatly improving over the years and seems to have a great plan for the future, it should still do more, in conjunction with the communities in the Phoenix Metropolitan Area.

The first suggestion that I would make is that Valley Metro become a state owned agency instead of being a group of individual city transit agencies working under one name (“Valley Metro (Phoenix),” 2007). I would like to suggest that the state legislature create an entity much like the Massachusetts Bay Transit Authority, or MBTA here in the Greater Boston Area and beyond. The MBTA came into existence on August 3, 1964 after being voted into law in June 1964. It is an Authority that is a political subdivision

of the Commonwealth which runs all public transportation in the state (“History: The Regional...,” n.d.).

If the State of Arizona created an authority much like the MBTA then it could truly implement smart public transportation planning that would not only affect all the communities in the Greater Phoenix Area, but all throughout Arizona. The current system of Valley Metro is inefficient as all the participating municipalities have varying goals and will inevitably advocate what helps their communities, not the whole region as a whole. Creating a state authority of Valley Metro will empower it to better plan public transportation throughout the state and create the most efficient and convenient transit that will benefit the region as a whole, while still taking into account all individual community issues. It will also be able to have a say in urban planning and be able to dictate where new development occurs as it can decide where to expand service to.

One thing that I would suggest be done differently is that the State of Arizona fund some of the daily operations of such an agency to ensure that service is top quality to continue attracting riders. The MBTA has been struggling financially due to a change in the amount the Commonwealth of Massachusetts gives the agency. With debt from improvement projects, the MBTA has been forced to increase fares. The subway fares have doubled from \$0.85 in 1998 to \$1.70 in 2007. This kind of fare increase hurts the lower income citizens who depend on the MBTA as well as the students who usually depend on it as well. The State of Arizona should ensure that Valley Metro has enough funding to infrastructure and system improvements so that it can maintain fares at a reasonable rate. The State should also ensure that Valley Metro handles its finances

properly and that it is actively trying to increase fare ratio as well as advertising revenue to ensure that it is financially viable.

Once Valley Metro functions as its own entity it should begin making immediate improvements to the reliability and convenience of its system, most notably its existing bus service. Although I am not able to determine how efficient and convenient their bus routes are due to my not living there currently, one of the complaints that I did read about was that the times of operation were inadequate. I would propose that Valley Metro extend operating hours to about midnight daily to ensure that all commuters and residents are able to be out late at night and still have safe alternative to driving when going home. Boston tested the Night Owl around 2003 for a few years which the extension of service hours on weekends until 2:30 am.

The Night Owl ran busses along the routes of the subway after the subway closed at 12:30am and extended the bus routes of the busiest bus routes. It was a great idea, especially in such a college town, but it was cancelled due to the cost associated with it and lower than expected turn out. It was a great disappointment to many of the citizens in Boston, but the MBTA noted that due to huge funding deficits, it could not maintain the service. Valley Metro could implement something similar, but in a smaller scale to ensure that it was available, but at a minimal cost. It could even charge a higher fee for this service as most that use it would rather pay a higher fee for a public transit ride than pay for a taxi cab. During the dialogue that I held with peers regarding the subject of public transportation, Benjamin Newlin noted that he was extremely disappointed when the Night Owl stopped service. He was willing to pay double the current fee as it would still be cheaper than taking a cab home (2007). Others, like me, had the same feeling.

By charging a higher fee, Valley Metro could compensate for the loss in fares due to low rider ship for this extended service.

Besides making the routes and operating hours more convenient, service should be more convenient in the form of a steady schedule. Jill Weiner noted that she loved the Silver Line bus because it is always three minutes apart from one bus to the other (2007). She noted that a steady schedule was very important because of the fact that she has to travel in town to many meetings and is reliant on the Silver Line; if the Silver Line wasn't as reliable, she would be forced to drive (2007). I think that this is a great example of how people want to take public transportation, but would rather drive due to the inconvenience of the transit system. According to another peer present in the dialogue session, Benjamin Newlin, he would not mind transferring from bus to bus if he knew they would always be one time (2007).

Andres Bernal and Julie McClure, who both were present in the dialogue, noted that one of the ideas they really thought could be applied to Phoenix is that of having bus only lanes in order to make the bus system more convenient and reliable (2007). These two individuals cited the example of the Silver Line portion that runs along Washington Street. Although the Silver Line is still subjected to traffic light stops, the specialized lanes allow the buses to stay close to schedule as they are not stuck in traffic due to rush hour congestion. Andres Bernal, who is from Bogota, Columbia, noted how it has one of the best bus rapid transit systems in the world. He mentioned that although it does have problems such as varying fares due to it being run by separate companies, it is very convenient and can get almost anybody from one place in the city to another (2007).

I agree with the suggestion made by these two friends of mine as this method can increase the reliability of the Valley Metro bus system. It is common knowledge, which was reinforced during my dialogue, that a major draw back of bus public transportation is that it is subjected to the same congestion as traffic and is therefore unreliable to get from one place to another at a specific time. Phoenix and the surrounding communities have very wide avenues and boulevards which can easily accommodate Bus Transit only lanes. Valley metro should work in conjunction with the communities it services to secure these lanes and have them be enforced by local law enforcement. Although this system could worsen the traffic congestion problem due to having one lane out of service, the benefits gained far outweigh the inconvenience. If anything, increased traffic along Rapid Transit Bus Routes will motivate drivers to take public transportation due to lack of traffic congestion when utilizing it. If Valley Metro converts all of its bus routes into rapid transit with designated lanes, then it will become far more attractive than it currently is and will be a good alternative to the light rail system in areas that are against light rail, such as Scottsdale.

Another way that Valley Metro and the City of Phoenix and surrounding communities can work together to make public transportation more convenient is to reduce the amount of transfers that are needed to get from one point to another. Jill Weiner stated that one of the major reasons she did not ride the subway in Boston was because she had to transfer various times to get from Davis Square to her destinations (2007). Andres Bernal jumped into the conversation and noted that he agreed with her and that Boston, as well as any other city with a subway or rapid bus system, should have a ring line that connects most of the other lines at their ending points (2007). He gave as

an example the city of Moscow which has a subway line that circles the city and connects all the other lines that go into the city center. I have also seen examples in Dallas and San Antonio, Texas; they each have a major highway that encircles the city center so that drivers do not always have to drive into the city center in order to get to another side of town.

The reason that I feel this is a great idea and should be implemented in the Greater Phoenix Area, is that this allows for faster travel times and creates a more convenient system. To give a local example, a ring (arc in this case) subway line in Boston that connected all the last stops (or close to) of all subway lines would allow the individual who wants to travel from Davis Square to Forrest Hills to jump on this ring line and simply go a few stops directly, instead of going from Davis Square into Downtown Crossing in Downtown Boston and transfer onto the Orange Line and take it outward bound to Davis Square. If Valley Metro is able to implement such a system, then it would allow for fewer transfers and less wasted travel time to get from one place to another. A downfall that can occur from a ring line is that just like in cities that have ring highways, the ring becomes a divider between the urban core which is usually inhabited by minorities and the poor, and the outer section which is the suburbs that are usually inhabited by Caucasians and the wealthy (“Mixed-use Development,” 2007). By simply being cognizant of this and working together with the city when making development plans, this can be avoided.

If any of these suggestions to improve the convenience of the public transportation system in Metropolitan Phoenix are to be implemented in one shape or form, Valley metro needs intelligent transportation system tools to ensure smooth

operations. An intelligent transportation system includes using such tools as providing on time traveler information systems, traffic control systems, automation location for buses, transit vehicle signal preemption, and electronic fare collection (Gayle, 2004). In order for the intelligent management transportation system tools to be useful and help maintain convenient on time public transportation, then there should be free and open communication within all parties involved.

Valley Metro could work with city officials by getting real time traffic information so that they can use alternate bus routes or to inform public transportation customers of delays and give them options to take alternate routes or other modes of transportation. Even with designated bus lanes, a bus could break down and clog up the line. Providing this real time information to customers will allow them to make alternate plans if necessary instead of waiting for a new bus once the broken one is taken out of the lane. Having electronic signs at stops and stations will also appeal to many citizens. I myself was very impressed with the Silver Line system as the stations on the Washington Street portion alert us when the next bus is expected to arrive. This has proven valuable in winter when I see that it might take 20 minutes for the next bus to arrive, so I either take a cab or take shelter for 18 of those minutes instead of waiting outside in the cold. Citizens in the Phoenix Metropolitan Area might not have to deal with snow conditions, but they most definitely have to deal with 100+ temperatures in the summer (“Phoenix, Arizona,” 2007)

The above examples lead me to a very important factor that I feel is imperative to attract more citizens to ride public transportation in Phoenix and the surrounding communities; that of making sure that the light rail stations and bus stations are not only

clean, but most importantly, protect the rider from the elements. With such high temperatures encountered on many days of the year, people should be protected from the searing heat and from the occasional rain that falls. This was touched upon during my dialogue with my peers; Andreas B., Andrew L., Julie M., Benjamin N., and Jill Weiner all agreed that the stations had to not only be clean, but protect the rider from the elements (2007). From what I have seen on my past visits to the city and from the Valley Metro METRO website, the city is failing in this department. I know that creating stations/waiting areas that do a good job of protecting the rider are far more costly than providing a simple bench or bris de soleil, but if public transportation is to truly be an attractive alternative to the automobile, it should offer the same protection from the elements that citizens get from their automobiles. There is no reason for citizens in Phoenix to be left waiting for about 20 minutes in 100+ degree heat in the summers.

This leads me to another subject that relates to protecting the citizens from the elements as they wait for the light rail or bus. All those who participated in the dialogue agreed with me that stations need to be attractive. To use Andrew Levine's words, "they need to sex them up" (2007). Andrew pointed out that this was a great opportunity to have stations and stops that are architecturally creative and help liven up the surrounding areas as well. Benjamin Newlin and Andres Bernal both suggested that architectural competitions could be held in order to create excitement about public transportation, but to also allow budding architects to make their mark; create a structure that will be seen by hundreds of thousands of riders throughout the years (2007). I agree greatly with this suggestion. Even simple architectural elements make bus stops and stations that much more attractive and enticing. In Boston, the new bus stops are simple glass enclosures

that are very modern, yet traditional looking. Although I think these bus stops are attractive, they do not protect the rider from the elements; something I can attest to personally. Stations and bus stops should be made attractive to the eye, but should also protect from the elements.

The participants of the dialogue, as well as current and former coworkers, also feel that the look and cleanliness of a station or stop can make a person feel safer than one that is dirty and dilapidated. The women, such as Julie McClure and Jill Weiner, stated that they feel safer when a station is clean and architecturally attractive such as most stops on the Silver Line Waterfront section (2007). Granted that Valley Metro does not operate a subway and does not need underground stations, the above ground light rail stations could be covered to not only provide shelter, but also be able to exhibit architectural creativity that will make riders feel safe, that they are protected from the elements, and that riding public transportation is an experience in itself, for good reasons that is.

What I am proposing will no doubt raise the cost of creating these stops, but I feel that they could be funded by corporate sponsors who would want to be associated with distinct architecturally transit stops. The stops could potentially only allow advertisements of those that funded the construction. This could limit the advertising revenue in the long run, but it is one method that I feel could be utilized in order to offset the increased cost of building these attractive transit stops. If this model were to be followed for all transit stops, bus or light rail, then the transit system of Phoenix could become famous because of this feature, making it a must-try for tourists and citizens alike. The subway stations in Moscow are known for their spectacular design as was

seen above. Increased interest will ultimately lead to increase ridership as well as a reduction in traffic congestion as more people are attracted to public transportation.

Safety is a major concern as was expressed by people that partook in my dialogue session and by any passerby that you ask. Transit stops should be safe enough to allow users to ride the system without having to worry about their safety. Riders, especially women, do not need to worry about being assaulted while awaiting the bus or the light rail train to arrive. Good lighting at night as well as police presence in larger areas are good ways to deter criminals from making public transit dangerous. In Boston, recent crimes on the subway have made some people nervous to ride certain subway lines and bus routes. One example that I can point out was when I read the Boston Metro in April that involved a shooting on a MBTA bus in broad daylight. This greatly unnerved riders, and prompted MBTA officials to increase transit police presence and to begin to install video cameras on individual buses to supplement the ones already in subway stations. Valley Metro should make sure to implement such measures in order to provide a safe environment and help discourage crime.

Another thing that is necessary to make public transportation in Phoenix more attractive is for Valley Metro to have a smart advertising campaign. By having a smart add campaign, Valley Metro can dispel the myth that public transportation is only for the poor, but instead make riding public transit seem 'cool.' Andrew Levine and Jill Weiner proposed that Valley Metro could create an add campaign in elementary and middle schools that would not only make Valley Metro seem like the 'cool' thing to do, but also begin creating a new generation that will not see public transportation being only for the poor, but as an environmentally friendly and cool way to get around Phoenix. The

marketing campaign could also involve giving away prizes such as tickets to one of Phoenix's professional sports teams, free monthly passes, or even monetary prizes for random riders. Valley Metro should be smart and proactively promote its transit system as an attractive, 'cool,' alternative to riding your automobile and being stuck in traffic.

As I have mentioned earlier, hearing conversations throughout my life from strangers and friends, public transportation tends to be seen to be only for the poor, with the exceptions of New York, Boston, and Washington D.C to name a few. In order to dispel this myth, Valley Metro should create a marketing campaign that will create a culture used to riding public transportation. One of Benjamin Newlin's greatest complaints was that people who ride public transport here in Boston are rude and have bad commuter etiquette (2007). Andres Bernal pointed to the etiquette observed by the public transportation riders in Europe. They always stand to the right side of escalators to allow those in a rush to climb up without being blocked. They also wait for all people to get off the subway, train, or bus before boarding, and most importantly do not shove themselves in when the subway, train, or bus is about to leave (2007). Valley Metro has the opportunity to use marketing for its new METRO light rail to educate the citizens of the Phoenix Metropolitan area to observe this etiquette and thus make it a pleasant experience for all riders. Most of the people that partook of my dialogue stated that bad etiquette made them only ride the subway if it was absolutely necessary. If the experience is made pleasant when using public transportation in Phoenix, then more people will be willing to ride it.

Public transportation in the Greater Phoenix Area needs to be improved greatly in order to attract the high enough volume necessary to be successful in combating and

easing traffic congestion. Valley Metro should become a state agency in order to more efficiently run the system and make it convenient and easy to use. This authority will also allow planning for the greater region as a whole without having to worry about having to appease certain members within the organization as it currently has to.

Utilizing such things as Bus Only Lanes for a rapid transit bus system as well as creating a ring route to lower travel time will make people want to use public transportation. Creating attractive, safe stations and stops, and ultimately using a smart advertising campaign will create a culture that would rather use public transportation than be stuck in traffic. Only when Valley Metro improves their service using the suggestions I have made will people truly see public transportation as a viable alternative to their automobiles.

Other Ideas to Increase Public Transportation Usage

Although the promotion of public transportation in the Greater Phoenix Area through smart growth and transit-oriented and mixed-use developments and improved quality and convenience of the transit system itself, other measure should be used in conjunction with the ones mentioned above. The reason I have grouped these ideas in the same area is that many of these would not be considered politically viable by the members of the Arizona State Legislature or the local community members, or they are simply ideas that could be promoted by the private citizen or individual business. They range from raising and imposing new taxes, to privatizing roadways or other infrastructure. Some of the ideas I will express would help ease traffic congestion, but

need further study to see how they could be implemented without many negative side effects.

One of the major tax increases that I would propose would be that of imposing a gasoline tax in order to make driving less desirable and convenient and thus making public transportation more attractive. This tax could also provide additional funding for the expansion and improvement of the existing public transportation and maintenance of existing roadways. This suggestion runs into several foreseen problems such as rejection by the local population and the fact that the automobile is almost the only means of transportation in the Greater Phoenix Area, and most of America for that matter. People might also point out that taxing gasoline will hurt the poor as they need the automobile to get to most jobs, thus the increased cost of gasoline will only hurt them financially, while the rich are not burdened so much by this tax.

One problem that I did not foresee and could continue to occur is that even with increased gasoline prices, drivers are not reducing the amount they drive. In fact, weekly gasoline demand in April 2007 increased as much as 1.9% over the same weeks in 2006 even as the average national price of a gallon of gasoline grew from \$2.71 to \$2.97 by the end of the month (“Despite cost of gas...,” 2007). This is something that is troubling because it shows how difficult it will be to discourage drivers from driving and in turn using public transportation.

Others might also point out the fact the current public transportation system is inadequate in the region to become a viable alternative to the automobile. Once the public transportation system is a viable alternative in the Phoenix Metropolitan Area, then this tax might seem more feasible. Even then, this is a bit of a catch 22 because the

tax implementation would increase public transportation usage and reduce traffic congestion by reducing the amount of automobiles on the roads; but it cannot truly be increased until the transportation system is truly a viable alternative.

The rise in the cost of gasoline would also ripple throughout the economy by raising prices of all goods as they require gasoline to be shipped from the suppliers to the stores. This might be averted by making many businesses exempt from this increase, though it might be nearly impossible to differentiate from private to business travel as well as implementing the exclusions. If a method could be discovered, it could alleviate the problem of causing inflation in the region for goods and services.

Another tax that could be imposed is that of a luxury tax on automobiles purchased in the region. The Phoenix Metropolitan Area has one of the highest car sales volumes in the country. Cars are so cheap and necessary to get around that most major car dealers operate on a seven days a week basis. The newspaper car ads that are normally only seen on the Sunday newspaper edition of most news papers appears daily in the Arizona Republic (Gordon, M. 2005). The low cost of the automobile and the necessity of it lead to a lot of the current traffic congestion problems in the city of Phoenix. As mentioned in the preceding paragraphs, this tax would impact the poor more severely than the wealthy and would also not be a viable option without a better public transportation system in place. This too is a catch 22 problem that will require further study to make it a viable tool to continue fighting traffic congestion by making public transportation successful in the Phoenix Metropolitan Area.

One of the ideas that I feel could best promote the usage of public transportation in Phoenix is that of charging a commuter fee such as is currently being proposed in New

York City by Mayor Bloomberg, and is currently being used in London England. These fees discourage commuters from using their automobiles and instead use public transportation, and in return, traffic congestion is greatly reduced. I particularly advocate the model of London be followed in Phoenix.

On February 17, 2003 London Mayor Ken Livingstone began implementing the \$10 per automobile toll program in London's Center, affecting 250 thousand vehicles that enter the city center everyday. The Traffic Management Zone's 174 exits and entries into the 40 block by 40 block area are marked with clear signs on the road and signposts. This eight square mile area consists only of 1.3% of the 617 square miles that compose greater London. The Traffic Management Zone is only in effect Monday through Friday from 7am to 6:30pm and excludes residents, government vehicles, disabled citizens, alternative fuel vehicles, and nine passenger plus vehicles, and tow trucks ("Lessons from London," 2003).

The tolling system is considered pretty high tech and cost about \$400 million dollars to implement, but is expected to make up costs fairly soon with the \$10 fee charged per automobile. Vehicles entering the zone have their license plates scanned by a computerized camera that then deducts the fee from the motorist's account. Drivers create accounts over the phone or the web, but if no account is created, motorists have until midnight of that day to pay for their travel or be charged a fine. Photos taken by the cameras at all entries are deleted by the end of the day in order to protect privacy of the motorists ("Lessons from London," 2003).

About 95 thousand daily payments, equaling about \$950 thousand a day, are collected in addition to the 6,000 penalties issued daily. Penalty fees increase the cost of

the toll to \$96 for the first 14 days, then \$160 if paid in 14-28 days, and ultimately \$240 after one month of not being paid. This high costs of fees reduced traffic by 20% within the first three weeks. The funds raised will be used for transportation and other civil projects once the programs initial start-up cost is paid for (“Lessons from London,” 2003).

Residents and other critics vehemently opposed the fees, but soon were silenced as they noticed the success in the reduction of traffic congestion in the Zone, the lack of negative economic impact, and the ease of its functioning (“Lessons from London,” 2003). The success of the experiment in London has shown that this type of fee structure could be a success if implemented properly. Even with this success, many of the same concerns are being brought up by the people of New York City. The most major concern is that those who need to drive into the city for economic reasons will be hit the hardest by these fees (Musso, 2007).

Taking into account the concern of the poor and those that need to drive being negatively impacted by these fees, I would suggest that if Phoenix were to implement this type of commuting fee, that it make sure that there are exceptions for those that would severely suffer from the fee and those that need to drive into these areas, such as residents, emergency vehicles, and delivery trucks. The hours and days of the week when such fees are charged should resemble those used in London. Once these exceptions are make to protect the poor and other affected citizens, the city should enforce the programs with high penalties just like London currently does.

I would suggest that this fee only be implemented in areas within a quarter mile from the light rail METRO stations once construction is complete, due to the fact that

public transportation system is currently not adequate enough to support that system in many areas in Metropolitan Phoenix. This would be the perfect place to implement such a commuter fee as drivers would have a convenient alternative to driving. The quarter mile is the accepted reasonable distance used when determining how far transit-oriented developments should be expanded while still maintaining the transportation station within reasonable walking distance for all involved. The fee will provide enough of an incentive to get motorists to use public transportation without being inconvenienced severely. As the light rail expands, so should the zones that charge the fee.

As mentioned earlier, many would oppose such a measure claiming that it will ultimately hurt the poor and those businesses in the fee zone, but it is up to city officials to educate the public that safeguards are in place to protect those negatively affected by fees, and to also assure them that by simply using the METRO system the burden of the commuter fee would be relieved. Local governments should also provide subsidies to business located in the area so that they ensure that their employees are not negatively affected by these fees. The fee will be considered unpopular, but it will ultimately discourage driving in areas that have a convenient public transportation alternative, and it will reduce traffic congestion such as is seen in London, England.

Another suggestion that I would propose for the cities and communities in the Greater Phoenix Area is that of the institution of toll roads along with the above mentioned commuter fee. Although toll roads are quite common in the Northeast, they are virtually non-existent in the West. This reason alone will lead to opposition, but it will mostly resemble that of the commuter zone fee I propose. The concerns about such

fees affecting the poor and the economy are valid, but with proper implementation and proper safeguards most negative impacts should be minimal.

One way in which Phoenix could implement tolls without incurring the cost of implementing such a system would be to privatize the portion of the roads that would become toll roads. As explained above, I would recommend that major roads along adequate public transportation become toll roads as the cheaper alternative of public transportation would be available.

Currently, banks and private investment firms are falling in love with public infrastructure as they are becoming smitten by the rich cash flows that they bring and are allowed to keep, along with the monopolistic advantages that keep them in business. Due to state and local leaders scrambling for cash to solve short-term fiscal problems, they are open to privatizing this infrastructure. It is expected that within the next three years, about \$100 billion worth of infrastructure property will be sold to private entities (Thorton, 2007).

Private firms lease the infrastructure from government entities for leases averaging about 100 years, which makes them responsible for all upkeep and maintenance, but they can keep most fees raised, if not all. Private firms are able to raise rates without the fear of being penalized at the ballot box and can thus experiment with ideas such as peak pricing in order to relieve traffic congestion (Thorton, 2007).

This type of fee structure does not come without its negative effects. One of the most major ones is that of the possibility of fees being raised too quickly. In Chicago, the Skywalk tolls are most likely to rise from \$2 in 1995 to \$5 by 2017. This may seem like a small amount, but if this rate were applied to the Pennsylvania Turnpike from the

Delaware River to the Ohio border in the 67 years of existence, the fee would be \$553 instead of \$22.75. Since these private entities can sell the infrastructure to other private entities, the quality of service might decrease in an attempt to raise profit margins. In Atlanta, the water treatment plants were privatized, but they fell into such disrepair that the city had to reacquire them in order to ensure the safety of the water supply (Thorton, 2007).

One way that the city of Phoenix can avoid the negative effects of creating toll roads and privatizing them is that they should ensure that deals struck have very clear language of the responsibilities of the owners and the consequences. The city can require that a certain percentage of revenue be paid to the city and that the fees rise close to the rate of inflation to ensure that the private parties do not raise prices severely. The city should also set the level of quality expected of these companies and fine them when they are out of compliance or be able to take back control of the infrastructure without having to pay a penalty to the private entity.

One last unpopular idea that I would suggest the greater metropolitan Phoenix Area, in particular the areas along the METRO light rail route, enact is that of reducing the amount of on street parking space available. This will create a shortage that will discourage individuals from driving their private automobiles and instead use public transportation. This will also lead to parking garages and parking lots to charge a high rate to park due to the high demand. The high cost of paying for parking, along with the shortage of on street parking, will most definitely discourage a great number of drivers from using their automobiles when public transportation is available. This may anger

many individuals as it will create issues for those who continue to use their automobiles, but it will make them think twice about driving to these areas.

A great example that I would like to mention is one time when a coworker and myself were going to have dinner in downtown Boston. We work in Dorchester and he drives his automobile to work every day from Brighton as he needs the automobile for work related business. On this particular day, he chose to give me a ride home, and then drove to Brighton to drop off his automobile and take the subway into town. I asked him why he was doing that, and he said because it was easier to take the T than to drive into downtown Boston. He cited the lack of parking spaces and the fact that parking garages charged an exorbitant amount to park his automobile in downtown. This showed me the power of making the driving a private automobile inconvenient. The inconvenience perceived of using an automobile will promote the usage of public transportation; the same thing I am suggesting that the municipalities in the Greater Phoenix Area enact.

I acknowledge that these suggestions might be viewed as too extreme by some, if not all readers, but they should seriously be considered for various reasons. As the population of Metropolitan Phoenix increases, so will traffic congestion. In order to help alleviate this, public transportation should become a more attractive alternative to driving, and by imposing such fees to motorists, they will be more inclined to utilize public transportation. The responsibility lies with Valley Metro to ensure that the public transportation system is adequate enough to be a viable alternative. The obligation also lies with the Federal, State, and Local Municipality governments to ensure that these fees and taxes are high enough to deter the high usage of automobiles, but to also protect the poor and businesses most affected by these fees. The municipalities should figure out a

way to make sure that the negative side effects of these fees are outweighed by the benefits.

Other Suggestions

The following suggestions are suggestions that require some government interference, but can mostly be applied by the private sector. The government can mostly provide incentives in the forms of tax breaks to businesses and individuals that promote the usage of public transportation.

One of the major suggestions that I would make is that car insurance companies provide discounted coverage rates to individuals who use public transportation. They could require that the car owner produce a year's worth of public transportation monthly passes in order to receive the discounted rate. The drivers should receive the discounted rate because it means that these drivers are less often on the road and in turn are less likely to in accidents. This is currently done in the Commonwealth of Massachusetts and it is a great way to entice motorist to use public transportation even if they could drive to work daily. This type of discount promotes the usage of public transportation during the week to commute to work and only utilizing the automobile during weekends, though individuals at times still utilize public transportation during weekends.

Employers could offer subsidies or discounts on public transportation monthly passes. The local and/or state governments could offer tax breaks to companies that provide such a service. My past two employers offered varying kinds of this benefit. One employer offered as an employee benefit a \$35 subsidy for MBTA monthly passes. The second employer offered no subsidy, but did take out the cost of an MBTA monthly

pass pre-tax so that our income would be reduced and we paid less federal and state taxes. This was such a great hit that people who owned automobiles almost always purchased the MBTA monthly pass in order to receive this tax benefit and to also receive the discounted insurance rate.

Lastly, local employers could provide other types of transportation that may not promote public transportation usage, but do offer a chance to reduce traffic congestion. These employers could provide company transportation in the form of shuttle buses to pick up employees at either a designated area or throughout a designated route. This would reduce the number of automobiles on the road as well as reduce the cost of transportation to its employees. Employers who perform this type of service for their employees should receive tax incentives from the state and local government in order to promote this type of service and to reduce the cost impact of the employer.

As was just seen, not all ideas have to be grandiose or heavily involving the local, state, and federal governments. Although I do suggest that the governments offer tax incentives to local business that offer the above mentioned services, these are things that individual employers and companies could enact or that the employees could lobby their employers to provide. This type of small action could have a great impact in changing the views that citizens have of using public transportation as well as add up to reduce traffic congestion a good amount. I include these ideas to show that even the individual citizen can do their part to promote public transportation and to reduce the dependence on the automobile.

CHAPTER 6

CONCLUSION, REFLECTIONS, AND AN EYE TOWARDS THE FUTURE

Ultimately, the preceding was my interpretation of the complexity of the problem of traffic congestion as a result of urban sprawl and how public transportation can be made a success and help ease traffic congestion. The solutions I propose are derived from my understanding of the problem and using the skill I acquired while in the Critical and Creative Thinking Program. You may be asking yourself, “Why should I listen to David? He’s not an expert on urban planning or public transportation policy.” To this I say, DON’T! This may be counter intuitive in that my synthesis project is utilizing what I have learned to solve a problem of my choosing, but I understand that this is my opinion; the opinion of an observer with minimal experience in urban planning and public transportation policy.

I want to point out that I understand the fact that the United States covers a huge amount of land that ultimately requires us to use automobiles to get around. As I have shown, many cities do not have a functional public transportation system that would allow everybody to abandon their cars. In fact, even New York City residents own cars, even though they primarily depend on public transportation for their transportation needs. The car is not only a necessity, but part of the American psyche and it will ultimately be generations before most Americans can accept public transportation as a viable alternative to the automobile. It will actually be generations before most cities can provide a public transportation system that will rival the automobile.

I am not advocating the abolishment of the automobile in any way, but I am advocating making public transportation a viable alternative that will reduce Americans' dependence on the automobile and thus help ease traffic congestion. I am advocating smart growth and increasing density so that Americans are no longer forced to depend on the automobile, but will ultimately have another choice; a choice that is better for the environment.

What I have tried to achieve with this synthesis project has been to not only educate myself on a major issue affecting us, but to educate the reader on the problem. I have given you facts and given you the opinions of my proposed solutions using these facts that I gathered. There is so much more information available out there that I was not able to incorporate into this project, that you should do your own research to either reach my conclusions, or reach one that is completely different from the ones that I have reached. This subject matter affects all Americans and it is up to each one to educate themselves on the matter and to try to make a difference by educating others, joining organizations that feel the same way you do, or to write to your representatives at all levels of government and making them aware of your concerns.

I chose Metropolitan Phoenix because of the fact that I will be relocating there in 2009, but every other city in America has its own unique problems and possible solutions. The ones I may have come up with could possibly apply to your home town, they may not. My aim was to educate myself on this subject and come to my own conclusions, but it is up to each and every one of you to educate yourselves and come to your own conclusions. My synthesis hopefully will have made you aware of the problem and aware of possible solutions. It is ultimately up to you to do your own part if you are

as concerned about the problems of urban sprawl and traffic congestion; my synthesis is only the start of your journey, as it is of mine.

As my time in the Critical and Creative Thinking Masters Program come to an end, I feel that it is very important to look back and reflect on what I have accomplished, learned, and come to realize. My synthesis project allowed me to investigate something very important to me by using all that I have learned and allowed me to reflect on the past two years. I am not the same person I was coming into the program and that is great in my opinion. In the following paragraphs I will reflect on the process of working on my synthesis project as well as reflect on the program as a whole. I feel it is also important to think towards the future and how I will use the synthesis project and what I have learned to realize my goals and all my future endeavors.

Reflection on Synthesis Project

In regards to the project, what I learned the most was that trying to increase public transportation was way more involved than simply building the infrastructure and telling people that it was there. I was aware that government, urban planning and development, and the public were interlocked in making public transportation a success or a failure, but I never imagined it was so deeply intertwined. I began the project with an idea of trying to promote public transportation and thought simply building transit-oriented development and all would be solved; boy was I wrong.

As I began my research and brain storming, it became clear that more and more factors were involved in trying to promote public transportation. Americans developed a culture where the automobile was the way of life. Urban planning and local, state, and

federal laws led to urban sprawl which in turn promoted more and more usage of the automobile. I realized that simply building a great transportation system and developing transit-oriented development would not be the solution to the environmental or traffic congestion problems that developed due to urban sprawl and American's view that owning a car was a sign of freedom. As I came across research I realized that there was more and more to this problem that needed to be considered in order to make public transportation a success.

As I turned in drafts and wrote and wrote, it became clear that I was actually tackling a very large problem that could not be easily done. I soon realized that I needed to understand the reasons for the failures of public transportation and why the car became the main means of transportation in this country. Only after I understood the complexity of the problem, could I attempt to find a solution that would allow the public transportation system become a success in the city of Phoenix.

Doing the research for this project was one of the hardest things that I had ever done. I would find something that I thought would be helpful only to realize that it was not. I often ran into the problem that I kept finding way to much information that was educational to me, but would ultimately bore my reader. This project was to be a synthesis of the skills I learned in the CCT Program and utilizing them to solve a problem. It was extremely difficult to strike a balance where I could educate my reader and allow them to understand the complexity, without boring them to death. It was a great experience having this problem because I had to use my creative and critical thinking skills to find a solution.

As the research was on going, I decided that I should ask people who ride the public transportation system in Boston what they think of public transportation in general. I opted to hold a dialogue with peers from various backgrounds and careers. This dialogue became one of the most fun and interesting aspects of my project. I was not only able to use what I learned in my dialogue, critical, and creative thinking courses, but I was able to understand how people who actually ride it feel first hand, not read what experts thought. I felt this was one of the most insightful things that I learned because ultimately, it is this type of person that will need convincing to leave their vehicles and start using public transportation.

I gained a lot of insight from my research, my dialogue, and my own thought process, but I came to the realization that ideas had to be practical. The ideas not only had to be practical, but they had to honestly address the fact that the city of Phoenix does not have the best transportation system in the US and that at the moment, the most convenient form of transport is the automobile. I had a great challenge ahead of me as I realized some of the ideas would not necessarily be a success in this city, or that in fact could not so readily be implemented. This challenge was discouraging at times, but allowed me to truly think critically of my solutions and to be realistic.

One thing that became apparent almost immediately was that there was an overwhelming amount of information regarding the subject matter covered in this synthesis project. In fact, I found so much information at times that I would almost panic trying to incorporate it all into this project. Ultimately, I had to make critical decisions on what to include and what to exclude from the project considering the time constraints. One factor that I decided to exclude, but that I feel is definitely very important is of how

many of my suggestions will be paid for. Many of the suggestions I make involve tax breaks, tax incentives, and increased costs which would lead for many to see the raising of taxes across the board as being the only solution. I greatly understand that this is not a viable solution as most citizens oppose tax increases and the poor are most negatively impacted by tax increases. It is my goal to continue to research the subject and to find new and creative ways on funding the projects that I propose. I would also suggest that you, the reader, think about this important aspect as you decide to take action and hopefully promote what I have suggested.

Ultimately, the process of doing my research using the skill that I learned through my two years in the Critical and Creative Thinking Masters Program was a challenging and rewarding project. I feel that I have accomplished something that I could have not honestly done before. I had been capable of writing a research paper and making inferences, but for the first time, I challenged my thought process, I challenged my thought process, and I made sure that I took in all points of view. I have come up with a synthesis project that has prepared me for my future goals of becoming a real estate developer who promotes public transportation. I know what is involved in making public transportation a success and as I plan my career ahead, I know what connections to make and what I need to learn. I have learned a great deal about the city of Phoenix, my future home. Any smart individual who wants to begin a business should know the field inside and out and know all the factors that can make their business a success or a failure, something I have gained from this synthesis project.

Reflection on the Critical and Creative Thinking Program

As stated before, the Critical and Creative Thinking Program has had a great impact on my life; personally and career wise. I came into the certificate program trying to improve my architectural design skills and to help delay my undergrad school loan payments, but soon learned that it was much more than I thought it would be. I soon decided to fully embrace the program and joined the Critical and Creative Thinking Masters Program.

The program was very unconventional and nothing like I was used to in my undergraduate career. This fact made me nervous at first and quite frankly skeptical. At the end of my first semester, I had become intrigued, but not yet fully convinced. The Creative Thinking course and the Seminar on Humor helped me loosen up a bit. These courses planted the seed of my eventual leaving the architectural world. My Philosophy course made me become more contemplative about things that I normally wouldn't be on and to accept others' points of view.

My second semester was the point that made me embrace the CCT Program and decide to join the Masters Program. My Cognitive Psychology course allowed me to see how people's minds worked and most importantly taught me about schemas and how this explained peoples' preconceptions. My Dialogue Processes course opened my eyes to a new way of communicating with people. It allowed me to truly listen to others for the first time and to be open to differing opinions by not allowing myself to judge but instead listen to what was being said. This class opened a whole new way of brainstorming and simply speaking with people. It has allowed me to create great 'containers' when having a dialogue with people.

These classes were great, but the one class that I feel truly changed my way of thinking and behavior was that of Critical Thinking. This course challenged me to learn to question my schemas and my personal beliefs. It wasn't that I began to question who I was, but more to question why I believed certain things and if I really did believe them or if I simply thought I believed them because I felt that was what was expected from me.

This Critical Thinking course also helped me become an individual who can now honestly think critically about decision regarding my personal and professional life. I now take a step back and think things over instead of letting my emotions run my decisions at times. I now attempt to look at the other person's point of view. I find myself swallowing my pride at times and either accepting that I am incorrect and another person is correct, or realizing that my idea is not as good as someone else. I used to be the type of person who argued with someone if they did not see my point of view; I was the type of person who was never wrong, but this class taught me to think critically about my ideas and decisions. I used to also be the type of individual who was very high strung and always stressing out when something went wrong, but thinking critically has allowed me to relax by taking a step back and analyzing the situation, realizing that it is pointless to worry about things that I cannot control. I am not a completely new person by any means, but I have begun to be critical of my thoughts and decisions which is greatly helping me in my personal and professional life.

My second year began with my taking the Practicum course as well as my Mathematics Teaching Methods course. The Practicum course was difficult in that it was run in a manner than I am not used to; it was very structured. I was at first frustrated and disappointed, but the methods and techniques I learned on writing and thinking about my

writing helped me greatly with this synthesis project. I was given the tools to take a different approach to how I write and think about writing; this will also be helpful as I proceed to go back to school to earn my MBA in the near future. My mathematics course helped me no longer dread mathematics and learn that there are many ways to teach it that make it interesting, fun, and easier to learn. I may not be going into education, but this course taught me that I can use various ways to make my learning fun and interesting.

The semester that has come to an end included my courses in Action Research and of course, my synthesis. This semester has been quite stressful and difficult, but it has enabled me to learn how to do action research and to synthesize the things that I have learned from school, and in life I feel. It has been a tough semester that was worth the work.

Looking back at my two years in the Critical and Creative Thinking Masters Program has allowed me to realize how much I have grown as an individual and academically. I have learned things I never thought I would learn and have come to love a program I once doubted. I have made great friends along the way and met many interesting individuals with different backgrounds and ideas. It wasn't always easy or fun, but the CCT program has inspired me to learn, to question, and to believe in myself. I move forward now with an eye and plan for the future; something I truly did not have before. The reason for this is that I am now asking the correct and tough questions that I never thought to ask myself.

A Look Towards the Future

Although I plan to utilize what I learned from my synthesis to aid me in becoming a real estate developer that promotes public transportation, it will be quite a while before I am able to pursue that career. I intend to continue learning about real estate development through personal research and inquiry, as well as following the progress being made in public transportation in the Greater Phoenix area. I selected this synthesis project to help me become more attuned to the problem and its complexity, and that will now allow me to be cognizant of what efforts are being made to solve it, and their success. The knowledge gained from this project will also allow me to tailor my future endeavors in order to become a real estate developer that promotes the usage of public transportation

Upon my relocation to the Greater Phoenix area in a few years, I will continue to work in the construction field in order to help me greater understand construction and building methods; knowledge that will make me an attractive candidate to large real estate developer companies. I will also enroll in an MBA program at Arizona State University to give me the other tools necessary to not only be an even more attractive candidate to real estate developer companies, but give me the tools to be able to run my own business. It is at this time that I will actively begin to find employment in a real estate development firm in order to educate myself about the field, gain experience, and network. During this time, I will be actively saving up capital in order to begin my own real estate development firm. I will begin slowly by developing homes near transit areas and eventually, when my company is large enough to develop large buildings, I will

begin to seek support from the City of Phoenix to create transit-oriented developments that will further promote the usage of public transportation.

On a personal level, I will continue to use the tools that I was able to receive from the Critical and Creative Thinking Program to help me improve as an individual. I feel that this program has greatly helped me in my attempt to become what I would consider a better person. I plan on continuing on improving my intrapersonal skills by not rushing into actions based upon my feelings and instead using critical thinking to analyze both point of views and coming to an understanding of both in order to reach a decision of action. By fostering this kind of improvement, it will not only help me on my business dealings, but also on my interactions between my loved ones and my friends. I will continue to develop my ability to overcome preconceptions and mental blocks that make me self-conscious and not be a creative individual in my professional and personal life.

This journey that I have just been through this past semester and past two years has had a tremendous impact on my life. I have gone from simply picking the CCT Certificate Program because it sounded interesting, to fully embracing the CCT ideals and joining the CCT Masters program. I went from an individual trying to improve his design skills and working at an architecture firm, to becoming an individual who decided to pursue his dream of becoming a real estate developer who is an advocate for public transportation, by changing careers and putting me on the path to achieving that dream. It was not only a journey of academic discovery, but most importantly, it was a journey of self discovery and self improvement. Ultimately, I have come to a conclusion that this journey through the CCT Program may be over, but the true life journey has just begun. I leave the University of Massachusetts a person who is striving to reach his dreams and

grow as an individual, having been given the tools and confidence by the Critical and Creative Thinking Masters Program. Thank You.

APPENDICES

Appendix A

This is a map of the Metropolitan Phoenix area.

Appendix B

This graphic shows how the City of Phoenix is sectioned off into areas that have specific goals due to the General Plan.

Appendix C

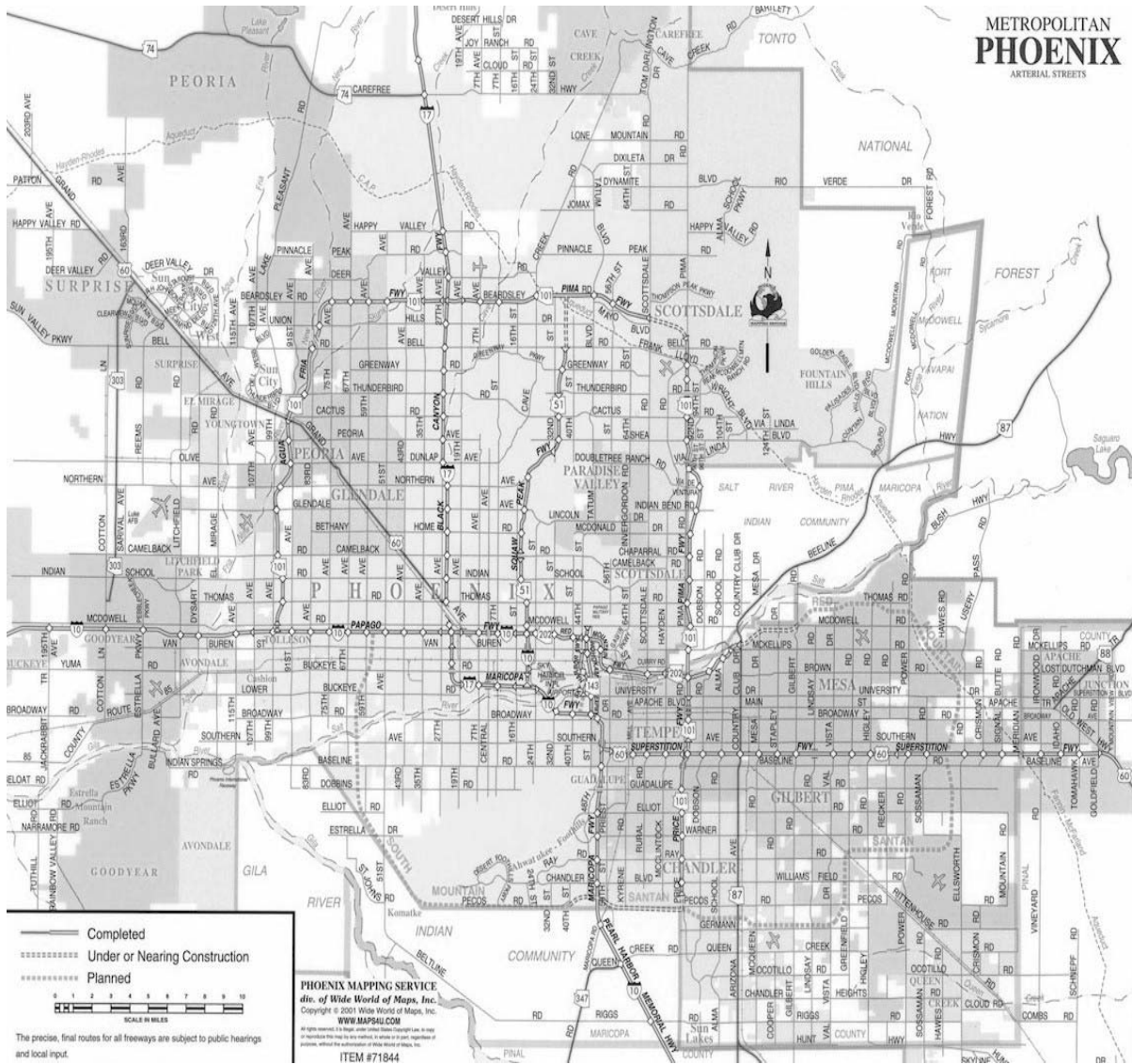
This is a map of the planned route of the METRO light rail. It currently is under construction.

Appendix D

This map shows the METRO light rail route currently under construction and future proposed extensions under study.

APPENDIX A

MAP OF METROPOLITAN PHOENIX

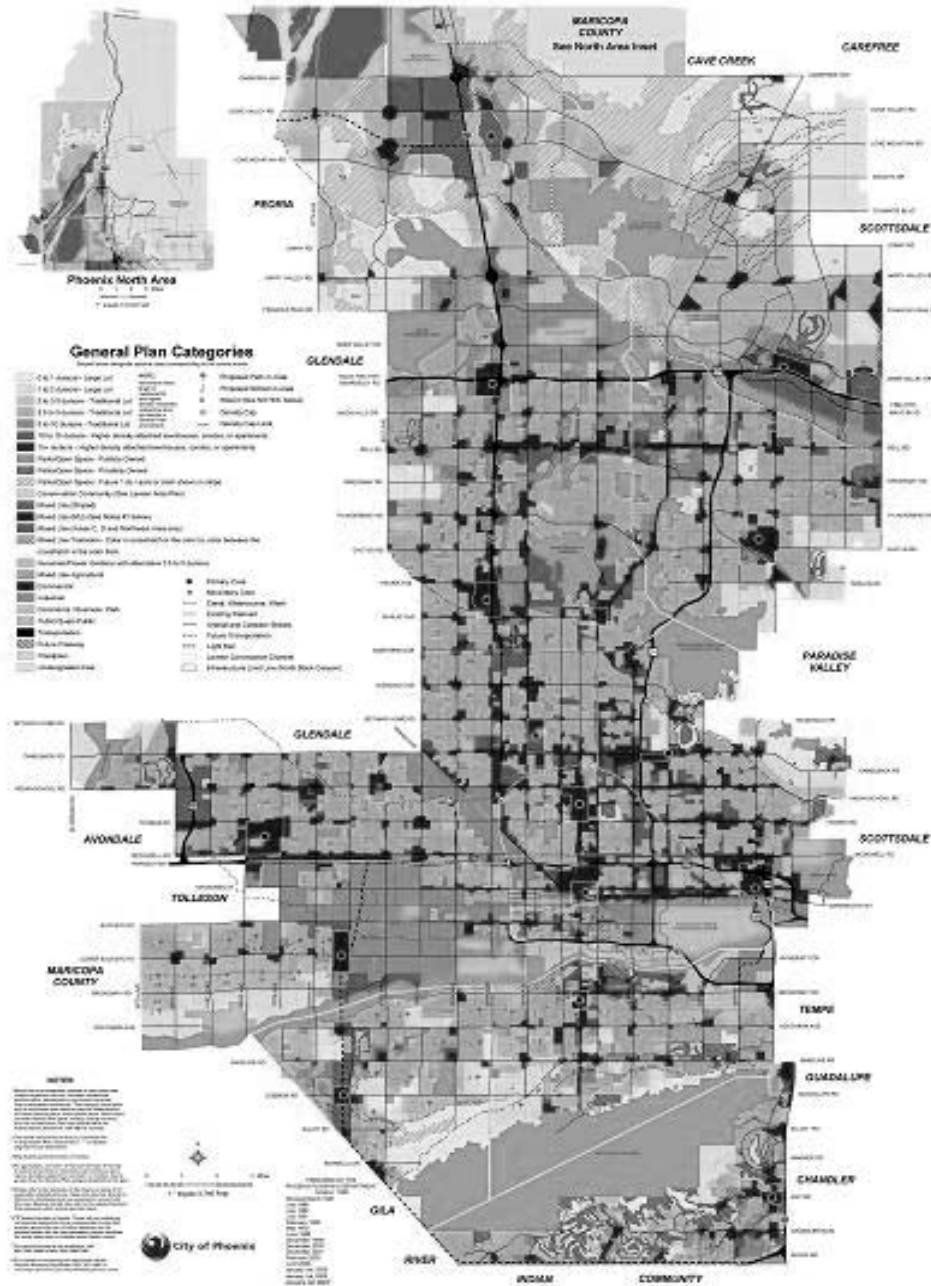


http://www.high-yield.com/map_phx.htm

APPENDIX B

GENERAL PLAN OVERVIEW

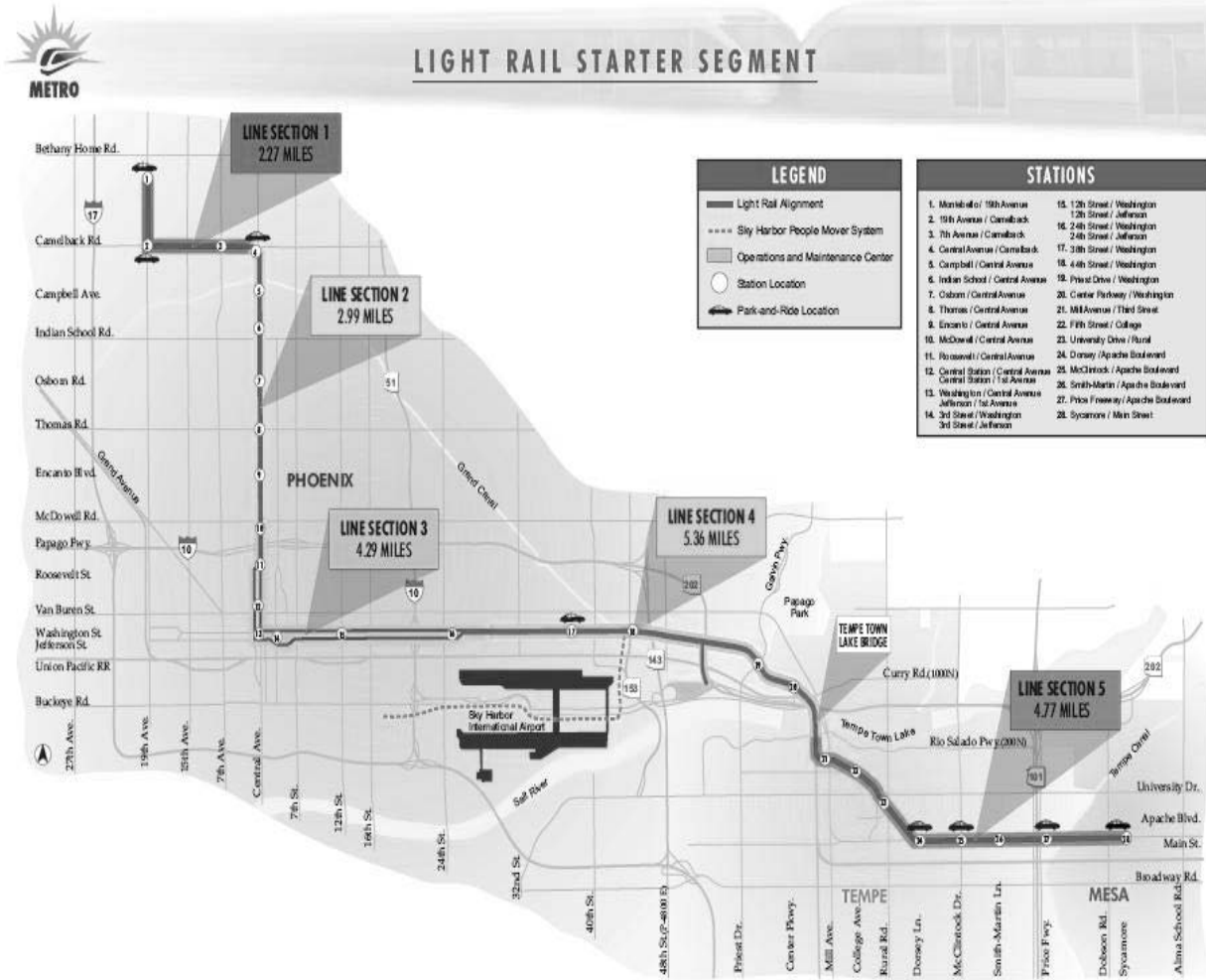
CITY OF PHOENIX GENERAL PLAN
A Vision for the Future



<http://phoenix.gov/PLANNING/gpmaps.html>

APPENDIX C

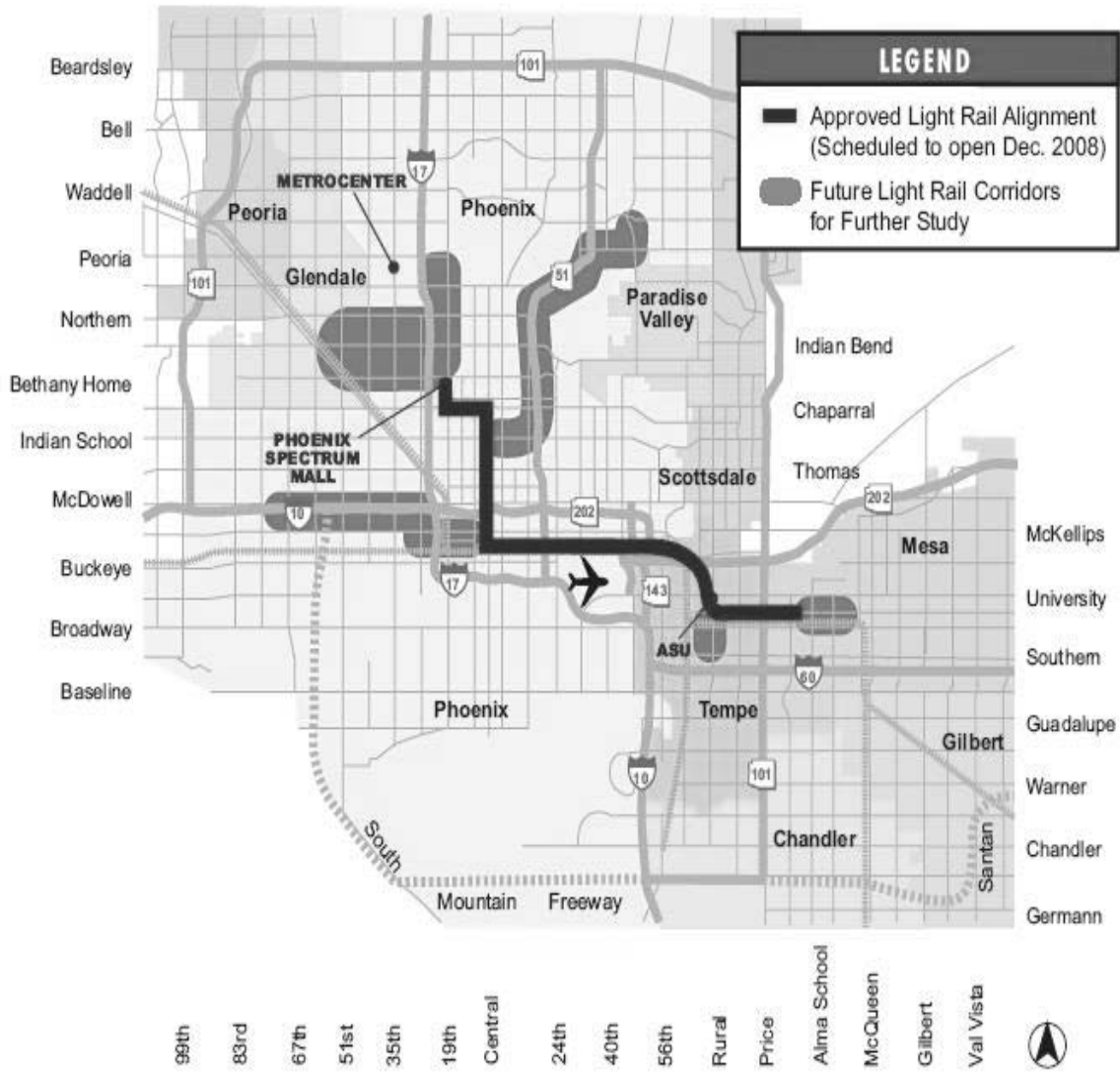
METRO LIGHT RAIL PLANNED ROUTE



http://www.valleymetro.org/METRO_light_rail/Downloads/Maps/maps/METRO-starter-line.pdf

APPENDIX D

METRO LIGHT RAIL FUTURE EXTENSIONS



http://www.valleymetro.org/METRO_light_rail/Downloads/Maps/maps/Corridor-Extentions-NW.jpg

BIBLIOGRAPHY

- Altshuler, A., Morril, W., Wolman, H., and Mitchell, F. (1999) *Governance and Opportunity: Metropolitan America*. Washington D.C.: National Academy Press.
- Arapkiles, T. et al. (1998). Stop Sprawl: Sprawl – The Dark Side of the American Dream. *Sierra Club Website*. Retrieved May 13, 2007, from <http://www.sierraclub.org/sprawl/report98/report.asp>
- Associated Press. (2007, May 15) Miami Drivers Have the Worst Road Rage: City earns not-so-distinguished distinction for second year in a row. *MSNBC.Com*. Retrieved May 17, 2007, from <http://www.msnbc.msn.com/id/18665115/>
- Associated Press. (2007, May 16). Despite Cost of Gas, Motorists Still Driving: Motorists are angry, but as cost flirts – or passes - \$4 they're still driving. *MSNBC.Com*. Retrieved May 16, 2007, from <http://www.msnbc.msn.com/id/18682561/print/1/displaymode/1098/>
- Autler, G. & Belzer, D. (2002, Fall). Countering sprawl with transit-oriented development. *Issues in Science and Technology*.
- Barnett, J. (2001) *Planning for a New Century: The Regional Agenda*. Washington D.C.: Island Press.
- Bunting, M. (2003) *Making Public Transportation Work*. Montreal, Canada: McGill-Queen's University Press.
- Burchell R. W., Downs, A., McCann, B., and Mukherji, S. (2005) *Sprawl Costs: Economic Impacts of Unchecked Development*. Washington D.C.: Island Press.
- Burke, J. & Ewan, J. & Underhill, M. (2004, December). Designing the urban preserve boundary: The City of Phoenix learns valuable lessons on how to develop and provide access to open lands in urban areas. [Electronic Version] *Parks & Recreation*.
- Calthorpe, P and Fulton, W. (2001) *Regional City: New Urbanism and the End of Sprawl*. Washington D.C.: Island Press.
- Citro, C. F. and Norwood, J. L. (1997) *The Bureau of Transportation Statistics: Priorities for the Future*. Washington D.C.: National Academy Press.
- Downs, A. (2003). *Still Stuck in Traffic: Coping with Peak-Hour Traffic Congestion*. Washington, D.C.: Brookings Institution Press.

- Fehr-Snyder, K. (2006, December 18). Phoenix plans to avoid further freeway goofs. *The Arizona Republic*. Retrieved April 7, 2007, from <http://www.azcentral.com/arizonarepublic/news/articles/1218rightofway1218.htm>
- Gayle, S. B. (2004, December). Looking at Transportation Planning with an Operations Perspective. *Institute of Transportation Engineers, ITE Journal*.
- Gordon, M. (2005, March 1). A Hot Time in Phoenix. [Electronic Version] *Ward's Dealer Business*.
- Gordon, P. (2006, June 29). Designing Downtown: The Phoenix Urban Forum Project. *Office of the Mayor – Phil Gordon at the City of Phoenix, Arizona Municipal Website*. Accessed April 10, 2007, from <http://www.mayorgordon.com/news/view.cfm?id-1815009694>
- Gordon, P. & Richardson, H.W. (2000, Spring). Defending Urban Sprawl. [Electronic Version] *Public Interests*
- Johnson, B. (2006, April 21). Critic of Transit-oriented Development says light-rail systems are ineffective. *St. Louis Daily Record & St. Louis Countian*.
- Katz, B. and Puentes, R. (2005) *Taking the High Road: A Metropolitan Agenda for Transportation Reform*. Washington D.C.: Brookings Institution Press.
- Kolson, K. (2002). *Big Plans: The Allure and Folly of Urban Design*. Baltimore, MD: The John Hopkins University Press.
- Labbe, M and Patriksson, M. (2002). *Transportation Planning: State of the Art*. Boston, MA: Kluwer Academic Publishers.
- Langdon, P. (2005, March). Urban Growth boundary Did Not Make Portland Unaffordable. [Electronic Version} *New Urban News*.
- Litman, T. (2007, January 8) Evaluating Rail Transit Criticism. *Victoria Transport Policy Institute*.
- Madsen, P and Plunz R. (2001) *The Urban Lifeworld: Formation, Perception, Representation*. New York, NY: Routledge.
- Mangini, V. J. (2005, September). Smart Growth - It Takes a Transit Village: Transit-oriented Development has become a popular means of increasing public transit use while promoting economic development. Here's how two states with contrasting policies approach TOD. [Electronic Version] *Railway Age*.

- Menzies, T. R. et al (2001) *Making Transit Work: Insight from Western Europe, Canada, and the United States – Special Report 257*. Washington D.C.: National Academy Press.
- Morris, D.E. (2005). *It's a Sprawl World After All: The Human Cost of Unplanned Growth and Visions for A Better Future*. Gabriola Island, Canada: New Society Publishers.
- Musso, A. (2007, May 5). *Commuter Fee Plan Will Hurt NYC Economy*. [Electronic Version] Poughkeepsie Journal.
- National Research Council, Transportation Research Board Staff (2001) *Contracting for Bus and Demand-Responsive Transit Services: A Survey of U.S. Practice and Experience – Special Report 258*. Washington D.C.: National Academy Press.
- Nelson, D. & Niles, J. (1999, April 24-28) *Measuring the Success of Transit-Oriented Development – Retail Market Dynamics and Other Key Determinants*. Retrieved April 10, 2007, from <http://www.globaltelematics.com/apa99.htm>
- Phoenix Planning Department (2006, January 1). City of Phoenix General Plan: A Vision for the Future - Map. *City of Phoenix, Arizona Municipal Website*. Retrieved April 10, 2007, from <http://phoenix.gov/PLANNING/gpmaps.html>
- Phoenix Planning Department (2006, January 1). City of Phoenix General Plan: A Vision for the Future - Poster. *City of Phoenix, Arizona Municipal Website*. Retrieved April 10, 2007, from <http://phoenix.gov/PLANNING/gpmaps.html>
- Phoenix Planning Department. (2007, February 15). Energy & Green Buildings. *Phoenix Environmental Sustainability Program Page at City of Phoenix Website*. Retrieved April 10, 2007, from <http://phoenix.gov/sustainability/energy.pdf>
- Phoenix Planning Department. (2007, February 15). Land Use. *Phoenix Environmental Sustainability Program Page at City of Phoenix, Arizona Municipal Website*. Retrieved April 10, 2007, from <http://phoenix.gov/sustainability/landuse.pdf>
- Phoenix Planning Department (2007, April 05). Phoenix General Plan. *City of Phoenix, Arizona Municipal Website*. Retrieved April 10, 2007, from <http://phoenix.gov/PLANNING/gpindex.html>
- Phoenix Planning Department. (2007, February 15). Recycling & Pollution Prevention. *Phoenix Environmental Sustainability Program Page at City of Phoenix, Arizona Municipal Website*. Retrieved April 10, 2007, from <http://phoenix.gov/sustainability/recycle.pdf>

- Phoenix Planning Department. (2007, February 15). Transportation & Air Quality. *Phoenix Environmental Sustainability Program Page at City of Phoenix, Arizona Municipal Website*. Retrieved April 10, 2007, from <http://phoenix.gov/sustainability/transair.pdf>
- Phoenix Planning Department. (2007, February 15). Water. *Phoenix Environmental Sustainability Program Page at City of Phoenix, Arizona Municipal Website*. Retrieved April 10, 2007, from <http://phoenix.gov/sustainability/water.pdf>
- Price, M. (2006, April 17). ASU researcher expects challenges as Phoenix continues to grow. *ASU Insight*. Retrieved April 7, 2007, from http://www.asu.edu/news/stories/200604/20060417_growth.htm
- Thornton, E. (2007, April 30). Highway privatizations seen as roads to riches: Investors clamor to take over America's highways, bridges, and airports. *Business Week Online through MSNBC.com*. Retrieved April 30, 2007 from <http://www.msnbc.msn.com/id/18396534/print/1/displaymode/1098>
- Shartin, Emily. (2006, January 19) Few gains in low-cost housing. [Electronic Version] *The Boston Globe*.
- Sunnucks, M. (2004, October 19). Light rail, Prop. 400 critics hope to get boost from Flake, Franks. *The Business Journal of Phoenix*. Retrieved April 4, 2007, from <http://www.bizjournals.com/phoenix/stories/2004/10/18/daily24.html>
- Unknown. (n.d.) *Affordable Housing*. Official Website of the City of Boston. Retrieved May 6, 2007 from <http://www.cityofboston.gov/priorities/housing.asp>
- Unknown. (2006). About Us. *Center for Transportation Excellence Website*. Retrieved May 13, 2007, from <http://www.cfte.org/about.asp>
- Unknown. (n.d.) *Affordable Housing*. Boston Redevelopment Authority Website. Retrieved May 6, 2007 from <http://www.cityofboton.gov/bra/affordablehousing/AH.asp>
- Unknown. (2006a) *Future Extensions*. Valley Metro Official Website. Retrieved April 7, 2007 from http://www.valleymetro.org/METRO_light_rail/Future_Extensions/index.htm
- Unknown. (n.d.). *History: A Brief History of Public Transportation in Metro Phoenix*. Retrieved April 1, 2007, from <http://www.azrail.org/trains/transit/transit-history/>
- Unknown. (n.d.) *History: The Regional System and the MBTA*. MBTA Official Website. Retrieved on May 6, 2007, from http://mbta.com/about_the_mbta/history/?id=968

- Unknown. (2006) *History and Local Funding*. Valley Metro Official Website. Retrieved April 7, 2007 from http://www.valleymetro.org/Valley_Metro/History_and_Local_Funding/index.htm
- Unknown. (n.d.) Inside Sierra Club. *Sierra Club Website*. Retrieved May 13, 2007, from <http://www.sierraclub.org/inside/>
- Unknown. (2003, Winter) *Lessons from London: Early Success for London's Big Pricing Experiment*. Transportation Alternatives Official Website. Retrieved on May 6, 2007, from <http://www.transalt.org/press/magazine/031Winter/17london.html>
- Unknown. (2007, March 28). *Light Rail*. Retrieved March 31, 2007, from http://en.wikipedia.org/wiki/Light_rail
- Unknown. (n.d.) METRO Corridor Extensions NW Map. *Valley Metro Website*. Retrieved May 22, 2007 from, http://www.valleymetro.org/METRO_light_rail/Downloads/Maps/maps/Corridor-Extentions-NW.jpg
- Unknown. (n.d.) METRO Starter Segments. *Valley Metro Website*. Retrieved May 22, 2007 from, http://www.valleymetro.org/METRO_light_rail/Downloads/Maps/maps/METRO-starter-line.pdf
- Unknown. (n.d.) Metropolitan Phoenix Map. *Rein & Grosseohme Website*. Retrieved May 22, 2007 from, http://www.high-yield.com/map_phx.htm
- Unknown. (2006, November 7). *Mixed-use Development*. Retrieved December 12, 2006, from http://en.wikipedia.org/wiki/Mixed-use_development
- Unknown. (1999, November). Myths & Facts About Oregon's Urban Growth Boundaries. *1000 Friends of Oregon Website*. Retrieved April 14, 2007, from <http://www.friends.org/resources/myths.html>
- Unknown. (n.d.) Myths and Fact Soundbites. *Sprawl Watch Website*. Retrieved April 15, 2007 from, <http://www.sprawlwatch.org/soundbites.html>
- Unknown. (2006, November 29). *New Urbanism*. Retrieved December 2, 2006, from http://en.wikipedia.org/wiki/New_Urbanism
- Unknown. (2007, March 31). *Phoenix, Arizona*. Retrieved March 31, 2007, from http://en.wikipedia.org/wiki/Phoenix%2C_Arizona

- Unknown. (2006, December 13). Phoenix Environmental Sustainability Program. *City of Phoenix, Arizona Municipal Website*. Retrieved April 10, 2007, from <http://phoenix.gov/sustainability/blueprint.html>
- Unknown. (n.d.) Population Growth and Suburban Sprawl: A Complex Relationship. *Sierra Club Website*. Retrieved May 13, 2007, from http://www.sierraclub.org/sprawl/SprawlPop_2003.pdf
- Unknown. (2007, March 26). *Public Transport*. Retrieved March 31st, 2007, from http://en.wikipedia.org/wiki/Public_Transportation
- Unknown. (2007, March 25). *Public Transportation*. Retrieved March 31, 2007, from http://en.wikipedia.org/wiki/Public_transportation
- Unknown. (n.d.). Stop Sprawl: Transportation Issues. *Sierra Club Website*. Retrieved May 13, 2007, from <http://www.sierraclub.org/sprawl/transportation/>
- Unknown. (n.d.). Stop Sprawl: What Can You Do About Sprawl? *Sierra Club Website*. Retrieved May 13, 2007, from http://www.sierraclub.org/sprawl/get_involved/
- Unknown. (n.d.). Trade and Sprawl: How Global Trade Rules Could Increase Sprawl. *Sierra Club Website*. Retrieved May 13, 2007, from http://www.sierraclub.org/trade/sprawl_trade.pdf
- Unknown. (2002, October 25). *Traffic: Traffic Time Index*. Retrieved April 8, 2007, from <http://www.ersys.com/usa/04/0455000/traffic.htm>
- Unknown. (2007, March 3). Traffic Congestion. *Wikipedia*. Retrieved March 4, 2007 from http://en.wikipedia.org/wiki/Traffic_congestion
- Unknown. (n.d.) Transit Benefits. *Center for Transportation Excellence*. Retrieved April 15, 2007 from, <http://www.cfte.org/trends/benefits.asp>
- Unknown. (n.d.) Transit Profile: The Denver area Light Rail System. *Center for Transportation Excellence*. Retrieved April 15, 2007 from, http://www.cfte.org/success/success_denver.pdf
- Unknown. (n.d.) Transit Profile: The Portland are MAX light rail system. *Center for Transportation Excellence*. Retrieved April 15, 2007 from, http://www.cfte.org/success/success_portland.pdf
- Unknown. (2007, February 7). *Transit-oriented Development*. Retrieved March 16, 2007, from http://en.wikipedia.org/wiki/Transit_oriented_development

- Unknown. (2006, March 17). Transit-Oriented Development & Light Rail. *Phoenix Government Website*. Retrieved April 6, 2007, from <http://www.phoenix.gov/ECONDEV/prjstrn.html>
- Unknown. (2006, January 28). Urban Growth Boundary. *Metro Region Website*. Retrieved April 14, 2007 from, <http://www.metro-region.org/article.cfm?articleID=277>
- Unknown. (2007, March 27). *Valley Metro (Phoenix)*. Retrieved March 31, 2007, from http://en.wikipedia.org/wiki/Valley_Metro_%28Phoenix%29
- Unknown. (n.d.) What the Critics Are Saying. *Center for Transportation Excellence*. Retrieved April 15, 2007 from, <http://www.cfte.org/critics/what.asp>
- Weiner, E. (1999). *Urban Transportation Planning in the United States: An Historical Overview*. Westport, CT.: Praeger.