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**The Feasibility of Transit-Oriented Development at the Bus Rapid
Transit Stations in Austin**

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Transit Stations in Austin**

by

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Abstract

The Feasibility of Transit-Oriented Development at the Bus Rapid Transit Stations in Austin

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The University of Texas at Austin, 2013

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The population of Austin, Texas is projected to reach 1.6 million people by the year 2040, which doubles the city's current population. The populations of cities in neighboring counties, Hays and Williamson, are projected to experience even more growth within the same time frame. For the first time in history, over half of the world's population lives in urban areas, so sustainable development is currently relevant for urban planning.

Until 2010, Austin lacked a mass public transportation system. Currently, Capital Metro, Austin's main public transportation operator, operates the Red Line of the MetroRail, a commuter rail system. The Red Line only serves a specific subset of the population in Austin and its northern neighbors, running from the city of Leander, through northern Austin, before its final stop in downtown Austin. Because of this, Capital Metro will begin operations on a new method of rapid mass transit: a bus rapid transit system called MetroRapid. With two lines opening in 2014, MetroRapid will

function as a mass rapid public transit option for two of the busiest north-south corridors in the city.

The opening of MetroRapid will provide opportunities to stimulate growth in areas focused around this transit system. Transit-oriented development can be a method of guiding Austin's future growth that will theoretically facilitate and encourage public transit use. The benefits to such growth would be reduced congestion, less dependency on automobiles and fostering communities that are vibrant and self-sustaining. This paper defines Transit-Oriented Developments (TODs), Bus Rapid Transit (BRT), and analyzes the MetroRapid stations themselves as Austin moves toward becoming a sustainable city.

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CHAPTER I: Introduction and Paper Outline

Sustainable growth in our communities is rapidly becoming the norm as urban planners and policymakers grapple with the increase of populations in urban areas worldwide. With this continuing trend, a shift in development from suburban sprawl to more compact, higher-density communities has become more prevalent. As such, city planners have increasingly placed an emphasis on developments that encourage and support public transportation systems, instead of the now-traditional personal automobile-centric models.

This paper will explore the land use and development potential of the parcels that exist within a half-mile radius of a selection of five future bus rapid transit (BRT) stations in Austin, Texas. This topic is relevant because the introduction of BRT as a public transit option in Austin will serve as a more cost-effective alternative to urban rail, which is continuously seeing delays and setbacks. BRT will begin running in Austin in January of 2014¹ and is expected to permanently alter public transportation options in the city. The opportunity for transit-oriented development (TOD) is evident with this new transit network, and its feasibility will be explored and assessed for the selected five BRT stations.

Bus rapid transit will theoretically provide the opportunity for Austin to stimulate growth around these major transit hubs. The BRT system in Austin is the first major public transit change to occur in the city since the opening of the commuter rail “Red

¹ Capital Metro. “What is Capital MetroRapid service?” MetroRapid, updated 2013. <http://www.capmetro.org/metrorapid-what.aspx> (accessed 16 Oct 2013).

Line” by Capital Metro. While urban rail could potentially be under construction in Austin as early as 2015, its future development is not a certainty. Transit-oriented developments have the greatest potential to come to fruition around these BRT stations.

High-density developments around transit centers could change the makeup of some areas of Austin, hopefully for the better, but potentially for the worse. This paper will address the potential for such change in five future BRT transit stations throughout the city. It will be written with the viewpoint of a land developer with the goal of increasing the prevalence of transit-oriented developments in the Austin area. It will be a feasibility analysis that will ultimately determine whether considering TODs in and around the BRT stations is viable. In this analysis, the most critical deciding factor for this will be the prevalence and size of single-family residential districts within the designated TOD site areas.

METHODOLOGY

The first step of collecting data will be to research literature on transit-oriented developments. It will be critical to evaluate the criteria of a location that deems it capable of supporting transit-oriented development. Through this research, a checklist depicting the criteria for TODs in potential sites will be generated. This checklist will be the basis for determining which Austin BRT stations possess the most characteristics for supporting transit-oriented development.

Case studies of TODs in other cities will be included to provide existing context for the success rate of such developments including, Carrollton, Texas, United States of

America and Calgary, Alberta, Canada. General literature on TOD and BRT will also be collected and presented in this paper to provide an overview and discussion for both systems. Both subjects will be discussed in reference to each other so that it can be more clearly understood how they can mutually affect each other.

A thorough history and discussion of BRT will be provided. This is so that the precise definition of bus rapid transit can be laid out as a rapid mass transit system. Until recently, the term “BRT” has been applied to several different types of public bus operations. By laying out a clear definition of BRT, the reader will better understand the exact characteristics a bus transit system needs to qualify as a BRT.. This definition will also serve as guidelines for evaluation of Austin’s future BRT system.

Five selected BRT stations and the areas surrounding them will be listed and analyzed. The selected stations will be in areas of varying existing density so as to present a complete picture of how the feasibility of implementing transit-oriented development in Austin may differ throughout the city. Information included in this site analysis is: existing land use, population projections for Austin, and if necessary, other nearby jurisdictions or neighborhoods, and the presence and intensity of single-family residential districts within the site areas. These are all components that could have a significant effect on the future development around the BRT stops.

Geographic Information System (GIS) maps will also be included to show the locations of the stations and the existing land use of the land adjacent to the stations. The purpose of mapping these sites is to more easily display the existing land use context of

the adjacent parcels to the proposed BRT stations. The maps will serve as visual aids for items that can be more easily analyzed.

Once the analysis for each site is complete, the findings on each site's TOD feasibility will be determined and presented. The conclusion of the paper will follow this information.

MAJOR SOURCES OF INFORMATION

The major sources of information gathered for this paper include, but is not limited to:

1. Capital Metropolitan Transportation Authority online resources

The Capital Metro website contains the plans for the new BRT system, called the MetroRapid system. It includes maps of the two lines and their stops, information on the vehicles that will be used in the system, scheduling, fare information, and its potential role in transit-oriented development in the Austin area. Capital Metro's MetroRapid page will be the main resource for BRT information in Austin.

2. Local government city planning websites and resources

In order to provide a thorough and complete assessment of the needs of certain BRT stations, demographic information for Austin and other nearby jurisdictions will be collected and included in this analysis. Other information from these sites, including comprehensive plans, will also be utilized for additional population growth projections.

3. City government resources that include information on both implemented and planned TODs for the case studies

These sources will outline the process of developing TODs from start to finish, and will include details on the transit system(s) they are based on, along with the steps city officials needed to take in order to realize the developments. Resources of the case study transit sites are also included here as they provide details about the public transportation systems and their stations.

4. Local government online GIS database for map exhibits and visual representations

Visual representations of the BRT stations and their land use context are important for depicting the results of the research. Additionally, Travis County parcel data in the form of a shapefile will be necessary in creating complete graphic representations of the sites.

ANTICIPATED FINDINGS

It is anticipated that the results of the analysis will show that the stops located within sites that currently have little to no existing development of single-family residential districts would be excellent options for TOD development. Locations with existing high-intensity development are expected to provide a greater number of obstacles for redevelopment, especially in the downtown Austin/central business district (CBD) area. The stations located in areas with the lowest existing development intensity are expected to be the best candidates for TODs. As such, the stations selected for

analysis in this paper are located closest to the outer perimeter of the city, including the northernmost and southernmost stations on each BRT route.

Additionally, based on the case study examples, it is also expected that currently no BRT station in Austin is a perfect candidate for TOD. Communities located in city suburbs that serve as residential centers for commuters may prove to be the best option for TOD projects. The next chapter in this paper will discuss TODs and will include a list of the criteria needed to complete a successful TOD, as well as the case studies.

CHAPTER II: Transit-Oriented Development

Transit-oriented developments are designed by prioritizing mixed-use and high-density design standards that have been built around transit stations.² At the beginning of the 20th century, personal automobiles were not the predominant mode of transportation throughout all areas of the United States. Walking and the use of horse-drawn carts were the more popular transit modes in less industrialized areas, while people in more urban areas relied on streetcars to make their daily commutes.³ Because of this, any real estate development would typically occur along the streetcar routes, as it was the most convenient area to live and work. It can be said that most developments in urban areas were early editions of TODs.

As the personal automobile gained popularity in later decades, development around transit corridors out of necessity became less prevalent in American cities. In 1956, the Federal-Aid Highway Act, signed by President Eisenhower, led to a nationwide public works project that constructed modern expressways.⁴ Consequently, the overarching need to live and work near public transit systems no longer existed. Now, nearly 60 years later, growing concerns over urban sprawl and global warming have stimulated efforts in real estate development to migrate back towards a TOD model.

² Embarq. "Transit-Oriented Development: Making it easier to get around." World Resources Institute, updated 2013. <http://www.embarq.org/en/solution/transit-oriented-development> (accessed 15 Oct 2013).

³ Embarq. "Transit-Oriented Development: Making it easier to get around." World Resources Institute, updated 2013. <http://www.embarq.org/en/solution/transit-oriented-development> (accessed 15 Oct 2013).

⁴ Federal Highway Administration. "History of the Interstate Highway System." U.S. Department of Transportation, updated 2013. <http://www.fhwa.dot.gov/interstate/history.htm> (accessed 15 Oct 2013).

The idea for developing compact, dense communities connected by public transit was discussed initially at the turn of the 20th century by Ebenezer Howard.⁵ The term “transit-oriented development,” however, was not coined until the late 1980s by Peter Calthorpe,⁶ an urban designer, planner, and architect from Berkeley, California.⁷ According to Calthorpe, TODs could be used as a guideline to promoting sustainable growth in America’s urban centers.⁸

STRUCTURE

TODs are typically designed to have a development center consisting of a transit station surrounded by the highest density developments in the project. Density will typically decrease the farther away from the TOD center the development is situated. Geographically, TODs will have radii measuring about ¼ to ½ mile so as to support pedestrian movement throughout and decrease automobile dependency. It is generally agreed that the longest distance most people are willing to walk anywhere in their commutes is ½ mile.⁹

Keeping TODs high in mixed-uses and density also solves the issue of “the last mile.” This concept refers to the issue in transportation planning in which utilizing

⁵ Carlton, Ian. “Histories of Transit-Oriented Development: Perspectives on the Development of the TOD Concept.” Berkeley Institute of Urban and Regional Development, updated 2009. <http://www.iurd.berkeley.edu/publications/wp/2009-02.pdf> (accessed 18 Oct 2013).

⁶ Carlton, Ian. “Histories of Transit-Oriented Development: Perspectives on the Development of the TOD Concept.” Berkeley Institute of Urban and Regional Development, updated 2009. <http://www.iurd.berkeley.edu/publications/wp/2009-02.pdf> (accessed 18 Oct 2013).

⁷ Calthorpe, Peter. “Peter Calthorpe.” Calthorpe Associates, updated 2013. <http://www.calthorpe.com/peter-calthorpe> (accessed 18 Oct 2013).

⁸ Carlton, Ian. “Histories of Transit-Oriented Development: Perspectives on the Development of the TOD Concept.” Berkeley Institute of Urban and Regional Development, updated 2009. <http://www.iurd.berkeley.edu/publications/wp/2009-02.pdf> (accessed 18 Oct 2013).

⁹ Metropolitan Atlanta Rapid Transit Authority. “Transit-Oriented Development Guidelines.” MARTA, updated 2013. <http://www.itsmarta.com/TOD%20Guidelines%202010-11.pdf> (accessed 18 Oct 2013).

public transit is only useful when traveling from the transit station to the final destination is convenient and efficient. The requirement of more than one mode of transportation decreases the willingness to use public transportation.¹⁰ The “last mile” refers to the distance from the station to the destination the commuter must cover, and if that distance is too long to traverse on foot, that is one mile or longer, utilizing public transit becomes cumbersome. As such, if a public transportation station is located in an area with a high concentration of suburban sprawl, it will not be an efficient decision for those living or working within this area to use the transit system because it is unlikely that it will be their sole method of transportation.

TOD CASE STUDIES

Case Study 1: Downtown Carrollton Station, Carrollton, Texas, United States of America

The City of Carrollton, Texas is a suburb of Dallas, and is located in three separate counties. It is adjacent to the I-35 corridor north of the City of Dallas, and is a residential hub for commuting workers. Carrollton’s city council prioritized transit-oriented development in and around its three Dallas Area Rapid Transit (DART) light rail stations. The new or redeveloped TODs were intended to contribute to the city’s vision of establishing sustainable districts in Carrollton.¹¹ The Downtown Carrollton station is

¹⁰ Balcik, Burcu, et al. “The Last Mile Distribution in Humanitarian Relief.” *Journal of Intelligent Transportation Systems*, updated 2008.
http://www.academia.edu/356840/Last_Mile_Distribution_In_Humanitarian_Relief (accessed 18 Oct 2013).

¹¹ Carrollton Development. “TOD History and Background: History of Carrollton’s Transit and Transit-Oriented Development Program.” Carrollton Development, updated 2011.
<http://www.carrolltontxdevelopment.com/index.aspx?page=1323> (accessed 16 Oct 2013).

located near the intersection of I-35 North and West Belt Line Rd. The station itself is adjacent to the historic downtown Carrollton district and is on the DART Green Line.

The Downtown Carrollton TOD, also known as the Downtown Carrollton Catalyst Project, will be completed in phases over several years. Phase 1, a mixed-use project called The Union at Carrollton Square (The Union), has approximately 10,000 square feet of retail space at street level, and approximately 300 multi-family residential units for rent on the upper floors.¹² The Union also includes a five-level parking garage. The parking structure is hidden in the interior of the development and is not located off of a main corridor. This planning promotes foot-traffic and pedestrian activities while simultaneously providing ample parking for residents and visitors to the area. This project was completed in 2012.¹³

Phase 1 is the most centrally-located development in the Downtown Carrollton TOD. This project began construction there with the buildings closest to the DART station. The goal for the Downtown Carrollton TOD is to encourage further mixed-use development and more compact growth in the surrounding areas. This catalyst project is being developed over land that was previously the Foxworth-Galbraith lumberyard, making the Downtown Carrollton TOD a redevelopment of land that was previously of industrial use. Higher property tax returns that cities gain through these redevelopments contribute positively to a city's ability to fund other important projects in the future.

¹² Carrollton Development. "TOD Downtown Catalyst Project: Union at Carrollton Square, Downtown Carrollton." Carrollton Development, updated 2011.

<http://www.carrolltontxdevelopment.com/index.aspx?page=1317> (accessed 16 Oct 2013).

¹³ Carrollton Development. "TOD Downtown Catalyst Project: Union at Carrollton Square, Downtown Carrollton." Carrollton Development, updated 2011.

<http://www.carrolltontxdevelopment.com/index.aspx?page=1317> (accessed 16 Oct 2013).

Case Study 2: The Bridges, Calgary, Alberta, Canada

The City of Calgary completed a successful TOD community in the Bridgeland neighborhood, called The Bridges. The development of public transportation was a high priority for the City of Calgary as early as 1976, when local officials made the decision to invest nearly \$1 billion in the construction of a light-rail transit (LRT) system.¹⁴ Prior to the completion of the LRT system, Calgary transportation officials established an express bus line to entice residents to use public transportation to travel from Bridgeland to the downtown CBD. Calgary's LRT system, called the C Train, is comprised of two lines that connect the city's outer neighborhoods with the central city.¹⁵

The Bridgeland station on Calgary's C Train Blue Line is located northwest of the downtown area. The Bridges community was completed in 2011 and was designed unofficially as a TOD because the term itself was not used to describe it at the time. Regardless of this, the characteristics of The Bridges community follow the major principles of a successful TOD. Its boundaries are directly north and adjacent to the LRT Bridgeland station. The density of development within The Bridges is high, especially in the area around the station itself. Building heights range from 3-12 floors, with the tallest buildings located closest to the LRT station. The entire development itself encompasses an area of 36.8 acres, however all residential units in The Bridges are located within 0.36

¹⁴ Canada Mortgage and Housing Corporation. "Transit-Oriented Development Case Study: The Bridges, Calgary." Canada Mortgage and Housing Corporation, updated 2009. http://www.cmhc-schl.gc.ca/en/inpr/su/sucopl/upload/66652_Nov5-w.pdf (accessed 17 Oct 2013).

¹⁵ Calgary Transit. "Calgary's Light Rail Transit Line." City of Calgary Transportation Department, updated 2013. http://www.calgarytransit.com/route_maps/lrt_stop.html (accessed 17 Oct 2013).

miles of the LRT station, thereby creating a pedestrian-friendly community that encourages the use of public transportation. Surface parking is also minimized, with parking predominantly available in underground garages. Removing parking from street view creates an optimal environment for foot-traffic by increasing safety through minimizing vehicle traffic.

TOD SITE POTENTIAL CHECKLIST

In literature, several guidelines exist that elaborate on the design and structure of TODs that include sets of characteristics that all TODs should have. Less prevalent, however, is a set of traits that make up a site on which TODs may be developed. The following checklist represents the set of characteristics of TOD sites gained from literature and case studies.

1. Is the site adjacent to a major public transportation system, such as bus rapid transit, light rail, subway, etc.? If not, is a major public transportation stop/station planned for future development?

The development of more compact communities with options for housing, jobs, and recreation within a half-mile radius is beneficial for urban areas but is not complete as a TOD without a public transit option included.¹⁶ The goal is to promote the use of public transit systems while discouraging the use of personal automobiles. A convenient and inexpensive mode of public transportation must

¹⁶ Center for Neighborhood Technology. "Center for Transit-Oriented Development." Center for Neighborhood Technology, updated 2013. <http://www.cnt.org/tcd/projects/ctod/> (accessed 16 Oct 2013).

be located within the compact community, otherwise the development cannot truly be called a “transit” oriented development.¹⁷

2. Do population projections support the need for high-density developments?

Sufficient justification for a local government to provide funding for transit-oriented developments must be present. One of the most significant indicators that TODs will benefit a community is population projection: if a community is expected to experience significant growth in future decades, efforts should be made by local government to guide this growth towards TODs.¹⁸ Doing so mitigates sprawl and would reduce automobile dependency, which in turn would reduce traffic congestion, air pollution, and noise pollution.¹⁹ If population projections do not indicate significant growth for a community, the use of TODs may not be beneficial and could ultimately remain vacant and unoccupied once built.

Without growth, new developments of all types will slow.

3. Does the site have a significant single-family zoned district within a half-mile radius that may negatively impact development plans?

¹⁷ Center for Neighborhood Technology. “Center for Transit-Oriented Development.” Center for Neighborhood Technology, updated 2013. <http://www.cnt.org/tcd/projects/ctod/> (accessed 16 Oct 2013).

¹⁸ Haas, Peter, et al. “Transit Oriented Development and the Potential for VMT-related Greenhouse Gas Emissions Growth Reduction.” *Center for Transit-Oriented Development*, updated 2002. <http://www.cnt.org/repository/TOD-Potential-GHG-Emissions-Growth.FINAL.pdf> (accessed 16 Oct 2013).

¹⁹ Haas, Peter, et al. “Transit Oriented Development and the Potential for VMT-related Greenhouse Gas Emissions Growth Reduction.” *Center for Transit-Oriented Development*, updated 2002. <http://www.cnt.org/repository/TOD-Potential-GHG-Emissions-Growth.FINAL.pdf> (accessed 16 Oct 2013).

Nearby single-family residential districts can be considered as an obstacle to new developments or redevelopments within a planning area.²⁰ The preservation of the identity and character of a neighborhood is usually valued highly by the community.²¹ Changes to the overall makeup of a community can be seen as threatening and met with hostility. For this reason, if the site is considering development as a TOD, existing single-family residential development should preferably cover a minority of the developable land area to reduce this potential obstacle. All city planning endeavors include input of the public who will be most affected by any new developments or changes.²²

²⁰ United States Environmental Protection Agency. "Encouraging Transit-Oriented Development: Case Studies that Work." United States Environmental Protection Agency, updated 2013. <http://www.epa.gov/dced/pdf/phoenix-sgia-case-studies.pdf> (accessed 17 Oct 2013).

²¹ City of Berkeley. "Land Use Elements: The Character of Berkeley." City of Berkeley, updated 2001. [http://www.ci.berkeley.ca.us/uploadedFiles/Planning_\(new_site_map_walk-through\)/Level_3_-_General/GPliteLand_Use_policies.pdf](http://www.ci.berkeley.ca.us/uploadedFiles/Planning_(new_site_map_walk-through)/Level_3_-_General/GPliteLand_Use_policies.pdf) (accessed 17 Oct 2013).

²² Hooper, Michael. "Public Participation: More Than an 'Orgy of Public Process.'" *Next City*, updated 2011. <http://nextcity.org/daily/entry/public-participation-more-than-an-orgy-of-public-process> (accessed 17 Oct 2013).

CHAPTER III: Bus Rapid Transit

Bus rapid transit is a form of mass public transportation designed to provide the “speed, reliability and amenities” of rail-based public transit, and with the lower infrastructure costs associated with a local bus transit system.²³ Local bus services are plagued with the same congestion and traffic issues associated with regular automobile traffic, as well as additional slow-downs related to fare collection and roadway alignment, among other things. In order for a system to be considered a BRT system, the vehicles must operate predominately in a fully-dedicated transit lane that eliminates the occurrence of traffic congestion issues during the commute. The inclusion of such a right-of-way is not necessary for the designation, but is characteristic of most world-class BRT systems.

THE INSTITUTE FOR TRANSPORTATION AND DEVELOPMENT POLICY

In 2013, the Institute for Transportation and Development Policy (ITDP) released *The BRT Standard 2013*, which serves as an evaluation tool for existing BRT systems.²⁴ The ITDP is an organization based out of New York City that specializes in addressing global transportation issues. The ultimate goal of the ITDP is “to bring about transport solutions that cut greenhouse gas emissions, reduce poverty, and improve the quality of

²³ Metropolitan Transit Authority. “Select Bus Service: What is Bus Rapid Transit (BRT)?” MTA.info, updated 2013). <http://www.mta.info/mta/planning/sbs/whatis.htm> (accessed 20 Oct 2013).

²⁴ Institute for Transportation and Development Policy. “The BRT Standard 2013.” ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

urban life.”²⁵ The ITDP employs a team of approximately 60 professionals, including architects, urban planners, transportation experts, developers, and financiers. They aim to influence global policy and increase awareness on the positive effects a thoughtfully planned transportation system can have on the environment.²⁶

The BRT Standard 2013 was created to provide a set list of suggested criteria for cities wishing to build a BRT system. It also evaluates 50 existing BRT systems from 35 cities and rates them according to how well they fit their BRT criteria. BRT systems can receive ratings of either “Gold,” “Silver,” “Bronze” or “Basic.” According to the ITDP, establishing a worldwide standardization of future BRT systems would lend credibility to the term “BRT” as a label for a transit system. For BRT systems that are evaluated as legitimate BRT systems, which are those that score at least a Basic rating, policymakers, planners, and riders can be certain that their transit system was established to increase efficiency, reliability, and sustainability. Having set guidelines that clearly define what constitutes an actual BRT system can help prevent non-rapid bus systems from using a “BRT” label to describe their system: “[t]he absence of an agreement among planners and engineers has meant that for every new BRT corridor that is world class, dozens of

²⁵ Institute for Transportation and Development Policy. “Who We Are: Fighting emissions, poverty, and pollution.” ITDP, updated 2013. <http://go.itdp.org/display/live/Who%20We%20Are> (accessed 25 Oct 2013).

²⁶ Institute for Transportation and Development Policy. “Outreach and Awareness: Putting transport at the center of the conversation.” ITDP, updated 2013. <http://go.itdp.org/display/live/Outreach+and+Awareness> (accessed 25 Oct 2013).

bus corridors that opened were incorrectly labeled BRT.”²⁷ *The BRT Standard 2013* can and should be used as a tool in designing and planning future BRT systems.

THE BRT STANDARD 2013 GUIDELINES

The guidelines of *The BRT Standard 2013* include the following criteria for a “basic” system, along with their associated point values:

1. Bus-way alignment (7 points)
2. Dedicated right-of-way (7 points)
3. Off-board fare collection (7 points)
4. Intersection treatments (6 points)
5. Platform-level boarding (6 points)

As part of this standard, scoring 33 points is the maximum possible for a BRT system that includes these “basics”.²⁸ In order for a system to be considered “BRT,” the system must score at least 18 points for these first five criteria, as well as 4 points each for bus-way alignment and dedicated right-of-way. The bus-way and dedicated right-of-way criteria specifically are considered the most crucial element for distinguishing bus rapid transit from a traditional bus service because their inclusion eliminates delays from traffic congestion and other vehicles and therefore provides a more efficient and inexpensive system.²⁹

²⁷ Institute for Transportation and Development Policy. “The BRT Standard 2013.” ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

²⁸ Institute for Transportation and Development Policy. “The BRT Standard 2013.” ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

²⁹ Institute for Transportation and Development Policy. “The BRT Standard 2013.” ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

Bus-way alignment refers to the location of the bus lane in relation to the rest of the transportation activities. The less impact the bus has on other areas of movement in the roadway, such as turning lanes, the more successful the bus-way alignment is considered.³⁰ For this reason, it was determined that the best location for a bus lane would be the centermost lanes of traffic, as this is the location that is least likely to impede turning vehicles on the roadway. BRT stations would accordingly be located in the centermost lane of the streets for accessibility. By not locating the bus lane along the curb, the bus will not impact other important curbside functions such as accessing parking lots, or blocking delivery vehicles and taxis. According to *The BRT Standard* 2013, the minimization of such delays should be the top priority of any BRT system.

Dedicated right-of-ways are a second high-priority characteristic that every BRT system should include. Appropriating BRT vehicles a dedicated right-of-way allows the buses to move efficiently because they will not be affected by traffic congestion caused by other vehicles. Enforcement of these dedicated roadways by keeping other vehicles clear of the BRT right-of-ways, is a significant issue. Because of this, different methods of separating roadways should be explored and considered. Some methods of roadway delineation include road markers, retractable electric bollards, painted asphalt, and video camera enforcement.³¹

Off-board fare collection is another time saving feature. Passengers paying their fares as they are boarding the vehicle can cause significant delays during a commute,

³⁰ Institute for Transportation and Development Policy. "The BRT Standard 2013." ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

³¹ Institute for Transportation and Development Policy. "The BRT Standard 2013." ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

especially during peak hours. Off-board fare collection can significantly reduce the amount of time it takes for passengers to board the vehicle, and reduce pick-up times. Two methods of off-board fare collection are currently in use for mass transit systems: “barrier-controlled” and “proof-of-payment.”³² Barrier-controlled off-board fare collection is the system in which passengers must pass through a barrier, such as a gate or turnstile, using their pre-purchased ticket, in order to reach the boarding platform. Ticket booths or machines may be placed at each station for convenient purchasing options. The proof-of-payment method involves all passengers boarding the bus and then displaying their tickets to an inspector, likely after the vehicle has already departed the station. While both of these methods of off-board fare collection accomplish the ultimate goal of reducing delays during pick-ups, proof-of-purchase is considered an inferior method of off-board fare collection because it risks “fare-evaders,” referring to passengers who board the vehicle without purchasing a ticket.³³ The barrier-controlled system runs no risk of this.

Intersection treatments refer to controlling activity that occurs in or around traffic intersections. For example, minimizing or even restricting turns that can be made by other vehicles across bus lanes is the main method of controlling intersection activity.³⁴ Restricting turns across bus lanes also increases BRT efficiency and safety. Another option for intersection treatments is traffic signal priority. The signal changes in favor of

³² Institute for Transportation and Development Policy. “The BRT Standard 2013.” ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

³³ Institute for Transportation and Development Policy. “The BRT Standard 2013.” ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

³⁴ Institute for Transportation and Development Policy. “The BRT Standard 2013.” ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

an approaching BRT vehicle when a traffic signal priority system is in place. In *The BRT Standard 2013* guidelines, turn restrictions are deemed more essential to a successful BRT system than signal priority, but both are useful in creating quick commutes.

Platform-level boarding keeps the floor of the bus level with the floor of the platform. This decreases the time needed to board and depart the vehicle. Many vehicles in a standard bus system include steps, which passengers need to climb in order board. This action takes time, especially for elderly or disabled passengers. In lowering the bus floor to the level of the platform and eliminating the stairs altogether, a significant amount of time can be saved. Platform-level boarding also reduces the physical stress that passengers would have to endure. The height of the level of the platform and the bus floor as a measurement is less important than the act of designing the two to be of equal height.³⁵ The ultimate goal is to reduce boarding and alighting time, rather than time needed to reach the platform.

A second trait of platform-level boarding is the reduction or elimination of the gap between the platform and the entrance to the vehicle. This concept is also known as “precision docking.”³⁶ Several technological advances have provided options for precision docking. Some methods include: installing Kassel curbs, implementing BRT vehicle guiding systems, or the use of boarding bridges.^{37,38} Kassel curbs are concave in

³⁵ Institute for Transportation and Development Policy. “The BRT Standard 2013.” ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

³⁶ Kantor, David, et al. “Issues and Technologies in Level-Boarding Strategies for BRT.” *Journal of Public Transportation, 2006 BRT Special Edition*, updated 2006. <http://www.nctr.usf.edu/jpt/pdf/JPT%209-3S%20Kantor.pdf> (accessed 25 Oct 2013).

³⁷ Institute for Transportation and Development Policy. “The BRT Standard 2013.” ITDP, updated 2013. <http://www.itdp.org/microsites/the-brt-standard-2013/> (accessed 25 Oct 2013).

form on the street-facing surface and realign tires of vehicles that butt up against them.³⁹ This allows the BRT vehicles to pull up to the stations properly aligned and with little to no gap between the platform and the bus entrance. Vehicle-based docking includes several options for precision docking. Optical guidance systems includes the use of a video camera installed at the front of the bus that sends vehicle position data to a computer which then steers the bus to the platform utilizing painted a pavement stripe on the platform.⁴⁰ Boarding bridges are small retractable “plates” that are deployed to eliminate the remaining gap after a bus pulls into the station.⁴¹ Retractable boarding bridges are an adequate option for eliminating platform gaps, but they can also require significant maintenance and upkeep and can increase the cost of operating the BRT system.

METRORAPID: BRT IN AUSTIN

In January of 2014, Austin, Texas will begin running its first bus rapid transit system operated by Capital Metro called MetroRapid.⁴² It will consist of 77 individual stops and two routes, 801 and 803 (see Figure 3-A), which will run along two of the

³⁸ Kantor, David, et al. “Issues and Technologies in Level-Boarding Strategies for BRT.” *Journal of Public Transportation, 2006 BRT Special Edition*, updated 2006.

<http://www.nctr.usf.edu/jpt/pdf/JPT%209-3S%20Kantor.pdf> (accessed 25 Oct 2013).

³⁹ Wood, Chris. “Bus Stop Innovation: A Comparison of U.K. Trials.” *The European Transport Conference, Proceedings of Seminar J: Traffic Management and Road Safety*, updated 1998.

<http://www.cilt.dial.pipex.com/comparison.htm> (accessed 25 Oct 2013).

⁴⁰ Kantor, David, et al. “Issues and Technologies in Level-Boarding Strategies for BRT.” *Journal of Public Transportation, 2006 BRT Special Edition*, updated 2006.

<http://www.nctr.usf.edu/jpt/pdf/JPT%209-3S%20Kantor.pdf> (accessed 25 Oct 2013).

⁴¹ Kantor, David, et al. “Issues and Technologies in Level-Boarding Strategies for BRT.” *Journal of Public Transportation, 2006 BRT Special Edition*, updated 2006.

<http://www.nctr.usf.edu/jpt/pdf/JPT%209-3S%20Kantor.pdf> (accessed 25 Oct 2013).

⁴² Project Connect. “Bus Rapid Transit: A Premium Service Connecting the Best of Austin.” Project Connect, updated 2013. <http://www.projectconnect.com/modes/bus-rapid-transit.php> (accessed 25 Oct 2013).

busiest and most congested corridors, North Lamar/South Congress and Burnet/South Lamar, respectively.⁴³ Route 801 will begin service early in January of 2014, and Route 803 will begin service in late summer of 2014. These BRT lines will have limited stops and within the downtown area, will operate in transit priority lanes. They will also include signal priority technology on the vehicles. The vehicles are going to be larger articulated buses rather than the typical Capital Metro bus to allow for more passengers. The stations of the MetroRapid system will include real-time vehicle arrival wait times for increased passenger information and convenience.

MetroRapid's transit priority lanes will be restricted for use only by the BRT vehicles and automobiles intending to make a right turn.⁴⁴ By including transit priority lanes, efficiency of the MetroRapid system will be increased and will theoretically entice Austin residents to utilize MetroRapid as their sole method of transportation. The lanes will be striped and will help the MetroRapid buses to stay on schedule and reduce traffic delays during peak commuting periods. At implementation, these transit priority lanes will only be constructed for routes 801 and 803 at the downtown stations along Guadalupe Street and Lavaca Street between Cesar Chavez Street and Martin Luther King Jr. Boulevard. They will be the right-most lanes of travel for both of these corridors. As a result of this lane placement, parking along the right side of the road for both Guadalupe and Lavaca will be eliminated to reduce potential conflicts between the buses and other vehicles. The eliminated parking lanes will instead become dedicated to

⁴³ Capital Metro. "What is Capital MetroRapid service?" MetroRapid, updated 2013. <http://www.capmetro.org/metrorapid-what.aspx> (accessed 25 Oct 2013).

⁴⁴ Transportation Department. "Transit Priority Lanes." The City of Austin, updated 2013. <http://austintexas.gov/prioritylanes> (accessed 25 Oct 2013).

cyclists, which will yield right-of-way to the MetroRapid buses. Additionally, all delivery trucks, taxis and other vehicles that will need to load or unload cargo will need to do so on side streets as it will not be permitted in the transit priority lanes.⁴⁵

Some existing regular Capital Metro bus routes that run through the downtown area will be shifted to utilize the new MetroRapid routes, and will reduce congestion on their previous corridors. During peak commuting hours, the transit priority lanes are expected to move up to 60 buses per hour, each carrying up to 101 passengers. The use of the transit priority lanes will also eliminate lane obstructions for other vehicles when buses are stopped for pick-ups and drop-offs, which previously caused delays in the regular bus system.⁴⁶

All MetroRapid vehicles will be equipped with traffic signal priority technology, which will extend green lights to allow the buses to cross an intersection when it is running behind schedule. Not only will this increase the efficiency of the MetroRapid system by helping the buses stay on schedule, it also will not affect the existing traffic signal synchronization already in place to keep traffic flow steady. The MetroRapid fleet will include 40 articulated buses with premium amenities including wireless internet access, low-floor boarding, extended headroom, smartphone ticketing, and sleek exterior and interior designs for aesthetic appeal.⁴⁷ Boarding on these vehicles may occur at any of the three doorways, which will reduce boarding and alighting times. The MetroRapid

⁴⁵ Transportation Department. "Transit Priority Lanes." The City of Austin, updated 2013. <http://austintexas.gov/prioritylanes> (accessed 25 Oct 2013).

⁴⁶ Transportation Department. "Drivers, Cyclists, Pedestrians, and More." The City of Austin, updated 2013. <http://austintexas.gov/prioritylanes> (accessed 25 Oct 2013).

⁴⁷ Capital Metro. "MetroRapid Vehicles." MetroRapid, updated 2013. <http://www.capmetro.org/metrorapid-vehicles.aspx> (accessed 25 Oct 2013).

stations themselves will be spaced approximately one mile apart and will be equipped with digital boards depicting MetroRapid bus real-time arrival information. Additionally, all stations will be well-lit, sheltered, and provide seating.⁴⁸

When MetroRapid is running in January of 2014, it will be the first rapid mass transit system to run in Austin solely within the city limits. With the low operating costs of a BRT system, if MetroRapid is successful in the community, Capital Metro may expand its public transit systems, offering services to additional areas of Austin. The most cost-effective method of such an expansion will be an expansion of MetroRapid because the costs of urban rail can be “very expensive, time-consuming, and at times controversial,”⁴⁹. Over time, efforts to bring Austin’s BRT system up to the standards presented by the BRT Standards 2013 guidelines can also be considered.

⁴⁸ Capital Metro. “MetroRapid Stations.” MetroRapid, updated 2013.
<http://www.capmetro.org/metrorapid-vehicles.aspx> (accessed 25 Oct 2013).

⁴⁹ Project Connect. “Right-of-Way Preservation.” Project Connect, updated 2013.
<http://www.projectconnect.com/modes/right-of-way-preservation.php> (accessed 25 Oct 2013).

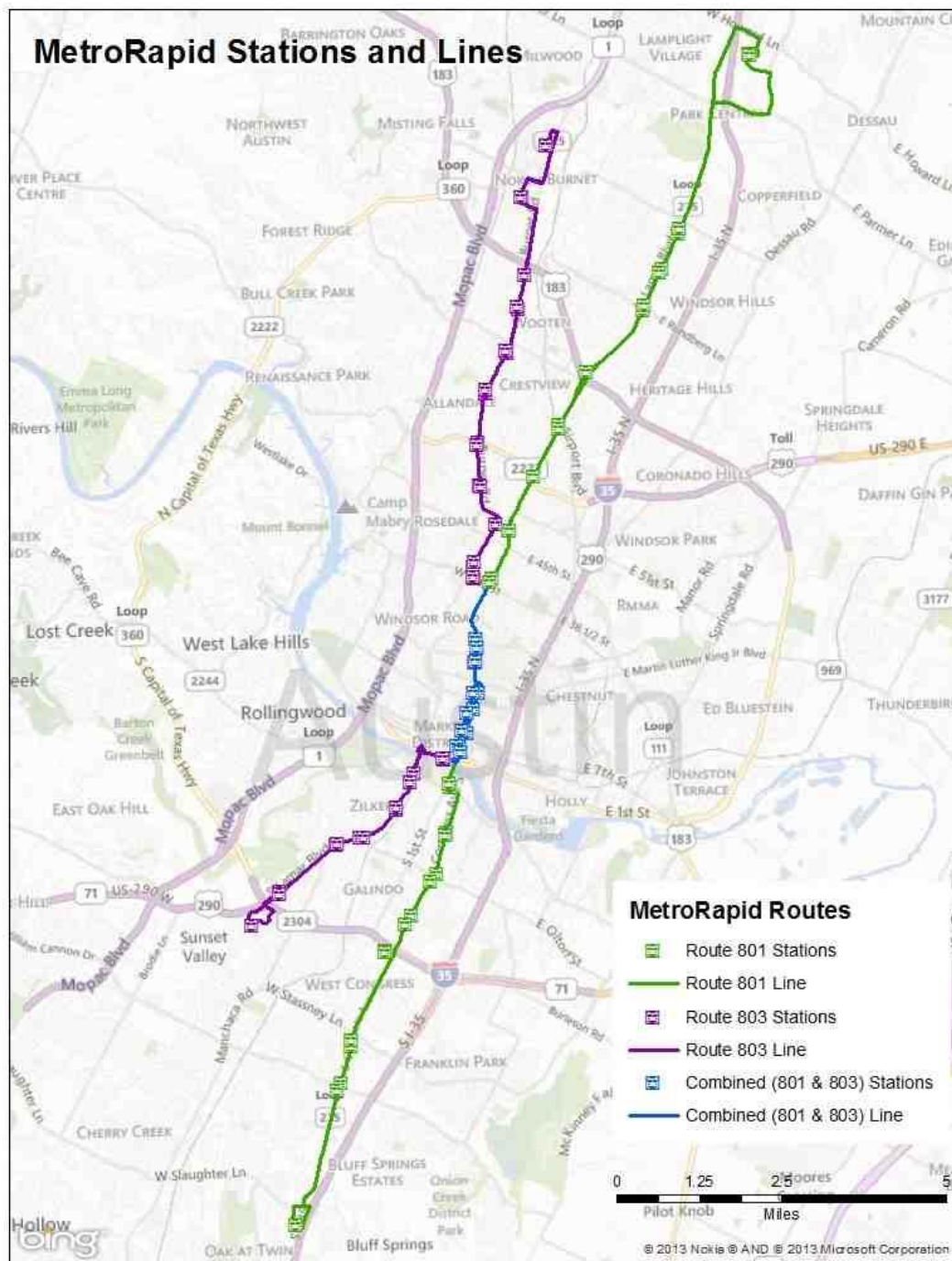


Figure 3-A: MetroRapid Routes Map

CHAPTER IV: MetroRapid Station Site Analyses

This chapter contains the five MetroRapid stations selected for transit-oriented development feasibility analysis (see Figure 4-A). The selected stations are:

1. Tech Ridge (Route 801)
2. The Domain (Route 803)
3. North Lamar Transit Center (“NLTC,” Route 801)
4. Westgate Mall (Route 803), and
5. Southpark Meadows (Route 801)

The Tech Ridge station and the Domain station are the first stops for routes 801 and 803, respectively. The Westgate Mall station and Southpark Meadows station are the end points for routes 803 and 801, respectively. These four stations will presumably be the locations for commuters traveling northbound or southbound from outside the Austin area, and will therefore become major transit centers. Transit-oriented development at these stations will increase density and theoretically attract these commuters to these stations as residents. Potential exists for these stations to transform from park-and-ride destinations if they were to be developed as TODs. The North Lamar Transit Center (NLTC) was selected because of its existing designation as a major transit center in the northern Austin area.⁵⁰

⁵⁰ Capital Metro. “North Lamar Transit Center.” Capital Metro, updated 2013. <http://www.capmetro.org/parkandrides.aspx?id=2078> (accessed 28 Oct 2013).

Included with each site analysis are a parcel map and a land use map. The parcel map includes all land tract parcels located within a half-mile radius of the station and the land use map is color-coded by land use according to the standards of the American Planning Association.⁵¹ The parcel data was obtained through the Travis County Central Appraisal District and the assumption is made that the information therein is the most accurate and up-to-date GIS data available. Additionally, the land use information was obtained through the City of Austin's GIS database,⁵² and the assumption is made that the information therein is the most up-to-date and accurate data available. The base map for each map was provided by Bing Maps⁵³ and was obtained through the ESRI online base map database.

As part of the analysis, each TOD feasibility question, as explained in Chapter 2, will be answered for each site. Finally, the determination will be made as to whether or not each site can support a TOD around its MetroRapid station.

⁵¹ American Planning Association. "Land Based Classification Standards: LBCS Tables." American Planning Association, updated 2001. <http://www.planning.org/lbcs/standards/pdf/InOneFile.pdf> (accessed 28 Oct 2013).

⁵² City of Austin GIS. "City of Austin GIS Data Sets." City of Austin, updated 2013. ftp://ftp.ci.austin.tx.us/GIS-Data/Regional/coa_gis.html (accessed 2 Nov 2013).

⁵³ Bing Maps. "Austin, TX." Bing.com, updated 2013. <http://www.bing.com/maps/#Y3A9MzAuMjg5NzMwfi05Ny43NjY0NzkmbHZsPTQmc3R5PXlmcT1hdXN0aW4lMjUyYyNTIwdHg=> (accessed 2 Nov 2013).

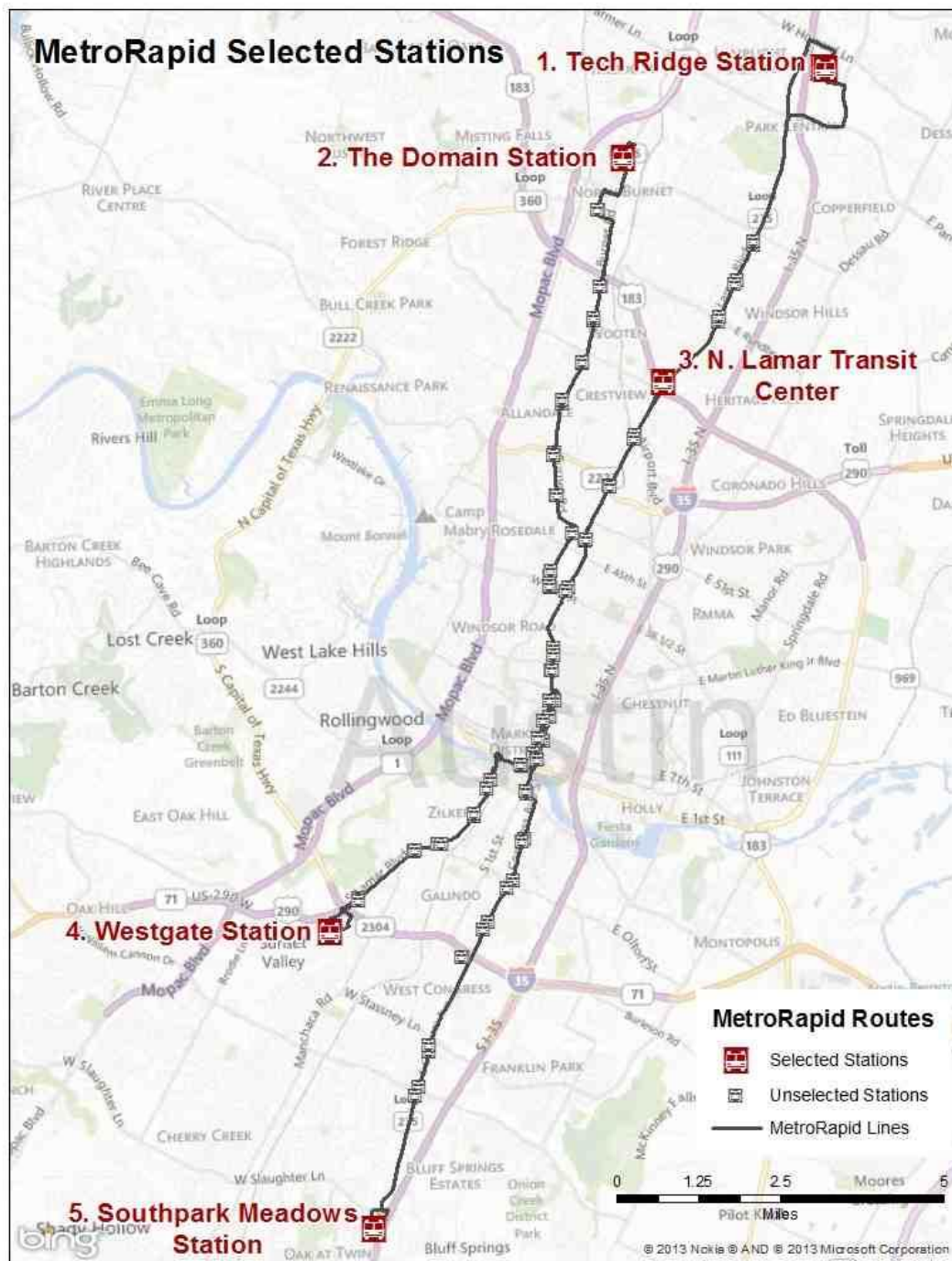


Figure 4-A: Selected MetroRapid Stations Map

1. TECH RIDGE STATION

The northernmost station to be located on MetroRapid Route 801 is Tech Ridge, located in north-central Austin on the eastern side of IH-35 between Howard Lane and Parmer Lane. Figure 4-1A represents the land parcels located within a half-mile radius of the station. The parcels located within the half-mile radius and west of IH-35 were excluded, as well as those located north of Howard Ln, and east of McCallen Pass. The existing land use shows no single-family residential parcels within the half-mile radius. Additionally, due to the station's existing use as a park-and-ride transit center, a large portion of the parcels are designated "Transportation Facilities" and are owned by Capital Metro (Figure 4-1B). This could make the development of a TOD more likely to come to fruition.

TOD-FEASIBILITY CRITERIA

- 1. Is the site adjacent to a major public transportation system, such as bus rapid transit, light rail, subway, etc.? If not, is a major public transportation stop/station planned for future development?**

Yes; the site currently contains a Capital Metro park-and-ride transit center and in the future will contain a station for Austin's MetroRapid transit system. Although the MetroRapid stations are not currently operational, the transit system will begin running in January, 2014.

- 2. Do population projections support the need for high-density developments?**

Population growth for the City of Austin is estimated to double by 2040 to approximately 1.6 million people.⁵⁴ It is also important to note that the Tech Ridge station is less than seven miles south of the Round Rock city limits. The City of Round Rock currently has a population of approximately 106,000 people and projects their population to grow to approximately 240,000 people by the year 2040,⁵⁵ which more than doubles its current population. With a significant portion of the Round Rock population commuting daily to Austin, the Tech Ridge station could prove to be a major transit center for residents in north Austin and Round Rock. Better still, as a TOD, Tech Ridge could attract some of this projected growth itself.

3. Does the site have a significant single-family zoned district within a half-mile radius that may negatively impact development plans?

No; according to the City of Austin-provided land use shapefile,⁵⁶ no single-family residential land use district exists within the site area. As such, single-family residents in the area will be not be directly impacted by the hypothetical construction of a TOD within this half-mile radius. Efforts to keep the Tech Ridge TOD as a park-and-ride will serve to appease nearby residents of single-family districts, who may continue to use it as such.

⁵⁴ City of Austin. "Imagine Austin Comprehensive Plan." City of Austin, updated 2012. ftp://ftp.ci.austin.tx.us/npzd/Austingo/web_IACP_full_reduced.pdf (accessed 2 Nov 2013).

⁵⁵ Department of Planning and Community Development. "Places and Spaces: Round Rock General Plan 2020." City of Round Rock, updated 2010. <http://www.roundrocktexas.gov/docs/1322422992010gp2020-final-web.pdf> (accessed 5 Nov 2013).

⁵⁶ City of Austin GIS. "City of Austin GIS Data Sets." City of Austin, updated 2013. ftp://ftp.ci.austin.tx.us/GIS-Data/Regional/coa_gis.html (accessed 2 Nov 2013).

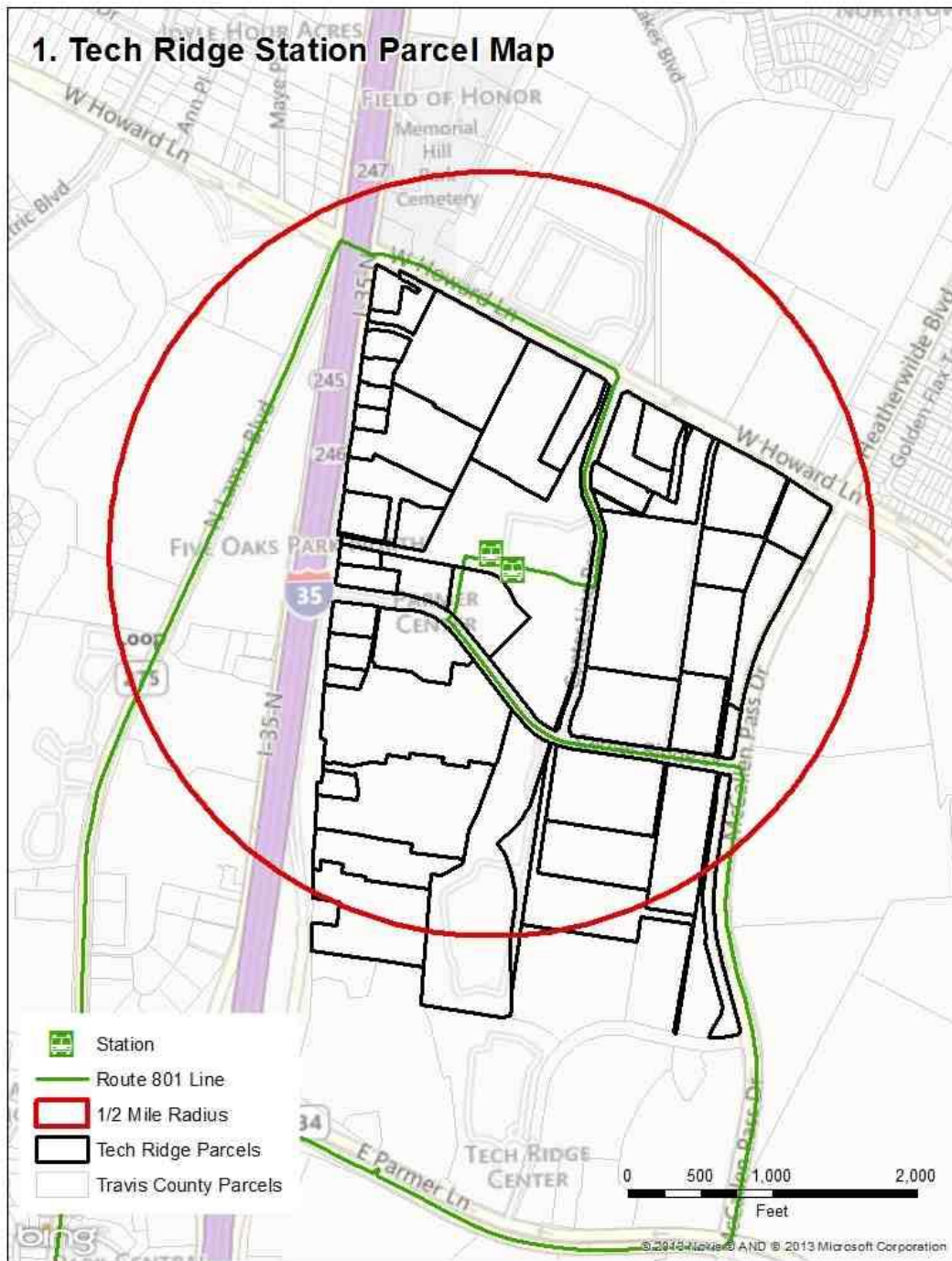


Figure 4-1A: Tech Ridge Station parcel map

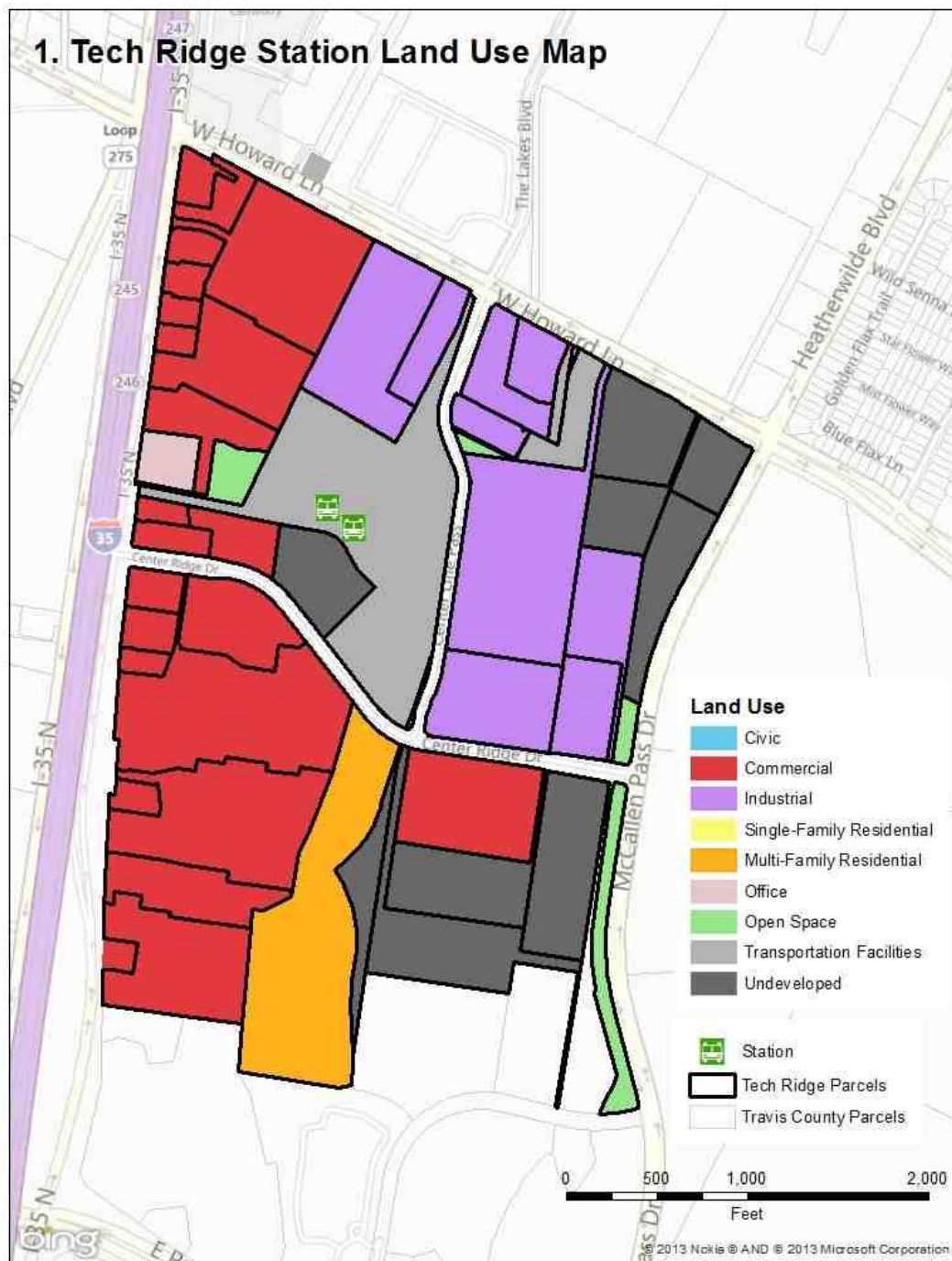


Figure 4-1B: Tech Ridge Station Land Use Map

2. THE DOMAIN STATION

The Domain Station is located west of the Domain mall at the intersection of Esperanza Crossing and Alterra Parkway. The Domain shopping mall is located in northwest Austin, just east of Loop 1/Mopac freeway, southwest of Duval Road, north of Braker Lane, and west of Burnet Road. Shown in Figure 4-2A, the half-mile radius also includes some parcels east of Burnet Road. The Domain station will be the northernmost stop on the MetroRapid Route 803, and therefore will be the gateway transit center to Austin for commuters from northwest Austin and possibly the cities of Cedar Park and Round Rock. Figure 4-2B shows the land use map which includes office and commercial as the predominate uses for the site radius.

TOD-FEASIBILITY CRITERIA

- 1. Is the site adjacent to a major public transportation system, such as bus rapid transit, light rail, subway, etc.? If not, is a major public transportation stop/station planned for future development?**

Yes; the station is located adjacent to an existing local bus line and will be the future site of Austin's MetroRail transit system. Although the MetroRapid stations are not currently operational, Route 803 containing the Domain station will begin running in late summer of 2014.

- 2. Do population projections support the need for high-density developments?**

Population growth for the City of Austin is estimated to double to approximately 1.6 million people by 2040.⁵⁷ Additionally, the Domain station will be the nearest MetroRapid transit center for Cedar Park, Texas, and will also be in close proximity to residents of west Round Rock, Texas. Population projections through 2040 are currently under review by the City of Cedar Park Planning department, to be released with the Imagine Cedar Park city plan in 2014.⁵⁸ However, Williamson County, which includes both Cedar Park and Round Rock city jurisdictions, is projected to add approximately 1 million people between 2010 and 2040, which grows the Williamson County overall population by 350%.⁵⁹ Some of this growth could potentially occur at a Domain TOD.

3. Does the site have a significant single-family zoned district within a half-mile radius that may negatively impact development plans?

No; according to the City of Austin-provided land use shapefile, no single-family residential district exists for the parcels within a half-mile radius. As such, single-family residents in the area will be not be directly impacted by the hypothetical construction of a TOD within this half-mile radius. Efforts to keep the Domain TOD as a park-and-ride will serve to appease nearby residents of single-family districts, who may continue to use it as such.

⁵⁷ City of Austin. "Imagine Austin Comprehensive Plan." City of Austin, updated 2012. ftp://ftp.ci.austin.tx.us/npzd/Austingo/web_IACP_full_reduced.pdf (accessed 2 Nov 2013).

⁵⁸ City of Cedar Park. "Imagine Cedar Park." City of Cedar Park, updated 2013. <http://www.cedarparktexas.gov/index.aspx?page=823> (accessed 5 Nov 2013).

⁵⁹ Denney, Amy. "CAMPO approves population estimates for 2040." *Community Impact Newspaper*, updated 2013. <http://impactnews.com/austin-metro/northwest-austin/campo-approves-population-estimates-for-2040-long-range-plan/> (accessed 5 Nov 2013).

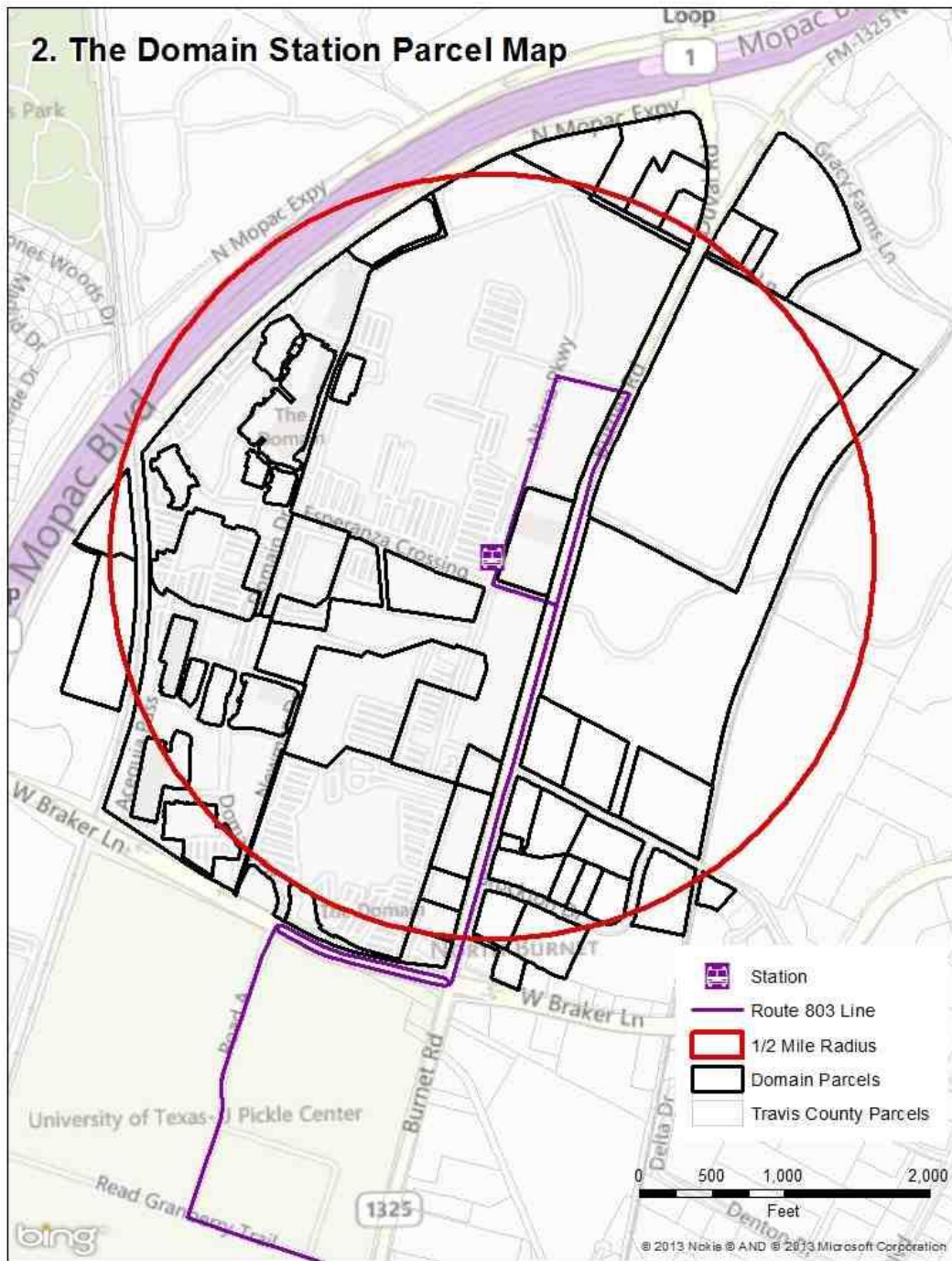


Figure 4-2A: Domain Station Parcel Map

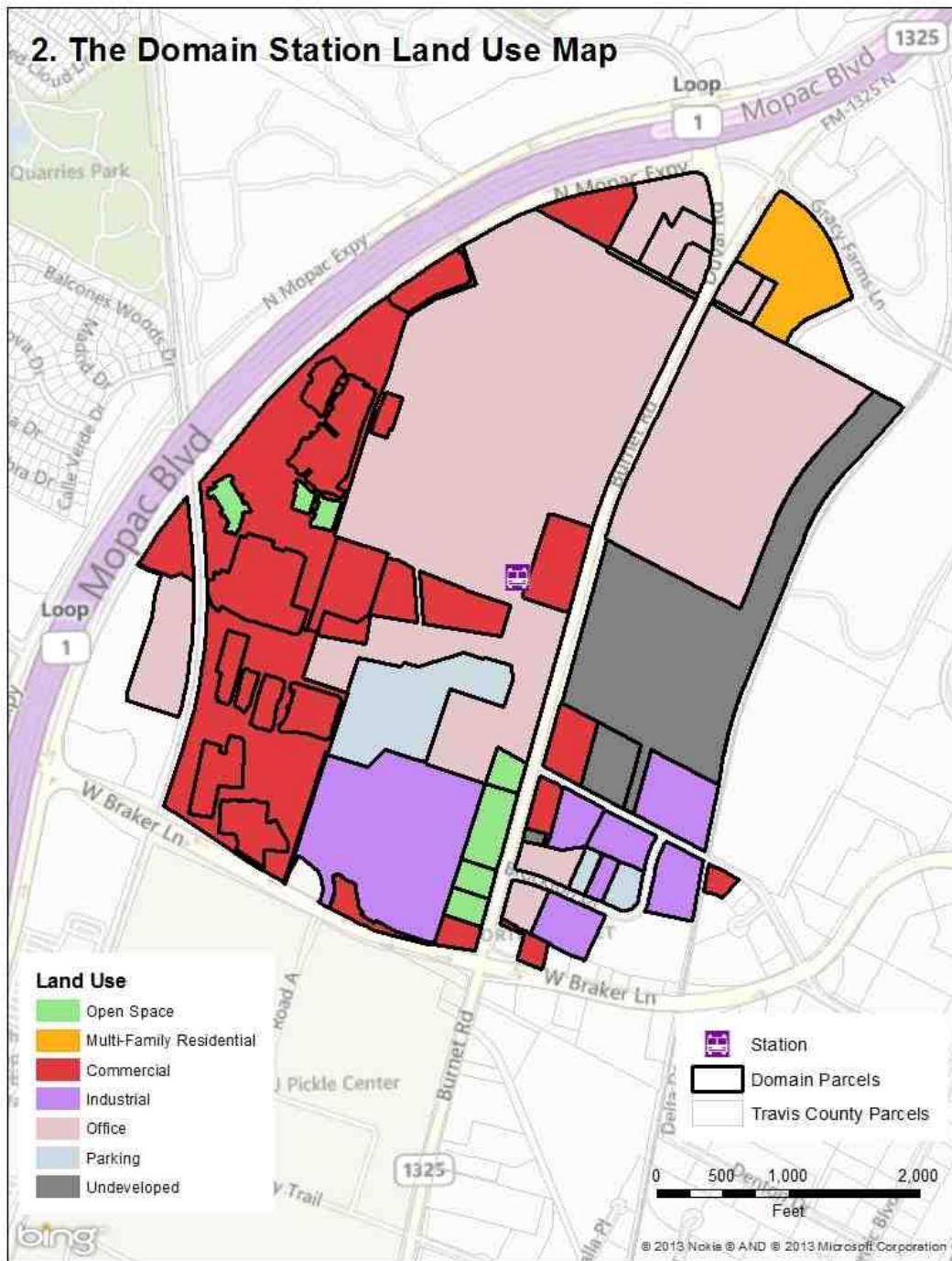


Figure 4-2B: Domain Station Land Use Map

3. NORTH LAMAR TRANSIT CENTER STATION

The North Lamar Transit Center (NLTC) Station is located in north-central Austin at the intersection of US Highway 183 and North Lamar Boulevard. Figure 4-3A shows the half-mile radius of the site including parcels on either side of N. Lamar but excluding those parcels south of Hwy. 183. The freeway acts as a barrier and hinders development to continue through it. The NLTC MetroRapid station will not be a gateway station for other jurisdictions and therefore, population projections from other jurisdictions will not be considered for this analysis.

TOD-FEASIBILITY CRITERIA

- 1. Is the site adjacent to a major public transportation system, such as bus rapid transit, light rail, subway, etc.? If not, is a major public transportation stop/station planned for future development?**

Yes; although the MetroRapid stations are not currently operational, Route 801 of the BRT transit system will begin running in January, 2014. The NLTC currently contains a park-and-ride transit center with regular local bus services.

- 2. Do population projections support the need for high-density developments?**

Population growth for the City of Austin is estimated to double by 2040 to approximately 1.6 million people.⁶⁰ The NLTC station is located within the North Lamar Combined Neighborhood Planning Area (NLCNPA). The most recent population changes recorded for this neighborhood plan were compiled as an

⁶⁰ City of Austin. "Imagine Austin Comprehensive Plan." City of Austin, updated 2012. ftp://ftp.ci.austin.tx.us/npzd/Austingo/web_IACP_full_reduced.pdf (accessed 2 Nov 2013).

amendment to the Austin Tomorrow city plan in June 2010.⁶¹ The NLCNPA plan includes population changes from 1990 to 2000 for both the neighborhood and the City of Austin. The statistics show that the NLCNPA increased in population by 37.2% compared with the City of Austin, which increased by 41.0%.⁶² These numbers suggest that the NLCNPA experiences steady growth at a rate just below that of the entire City of Austin. Assuming this growth trend remains true for population projections through 2040, the NLCNPA could see growth, although not as significant as Austin as a whole.

3. Does the site have a significant single-family zoned district within a half-mile radius that may negatively impact development plans?

A single-family residential district exists within the site in the north-central area of the site (see Figure 4-3B). Comparatively, this district represents an insignificant portion of the area, as a majority of the site contains multi-family, industrial, and commercial uses. The large portion of multi-family land use indicates that the site already supports, to a certain extent, land uses with increased density than that of single-family residential. This is a positive indication for the success of a potential TOD at the NLTC station.

⁶¹ Neighborhood Planning and Zoning Department. “North Lamar Combined Neighborhood Planning Area Future Land Use Map.” City of Austin, updated 2013. <ftp://ftp.ci.austin.tx.us/npzd/Austingo/nlamar-combined-np.pdf> (accessed 5 Nov 2013).

⁶² Neighborhood Planning and Zoning Department. “North Lamar Combined Neighborhood Planning Area Future Land Use Map.” City of Austin, updated 2013. <ftp://ftp.ci.austin.tx.us/npzd/Austingo/nlamar-combined-np.pdf> (accessed 5 Nov 2013).

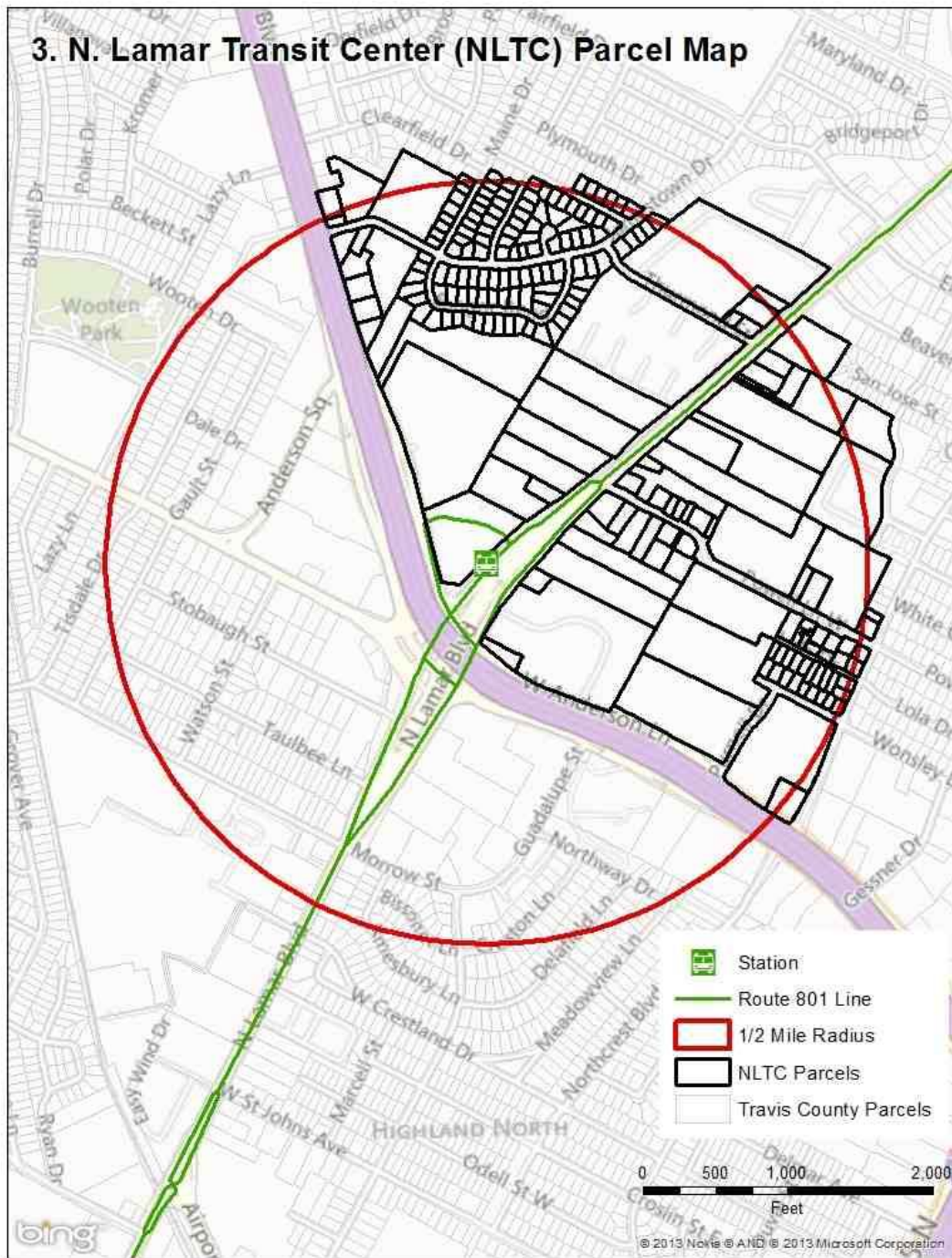


Figure 4-3A: NLTC Station Parcel Map

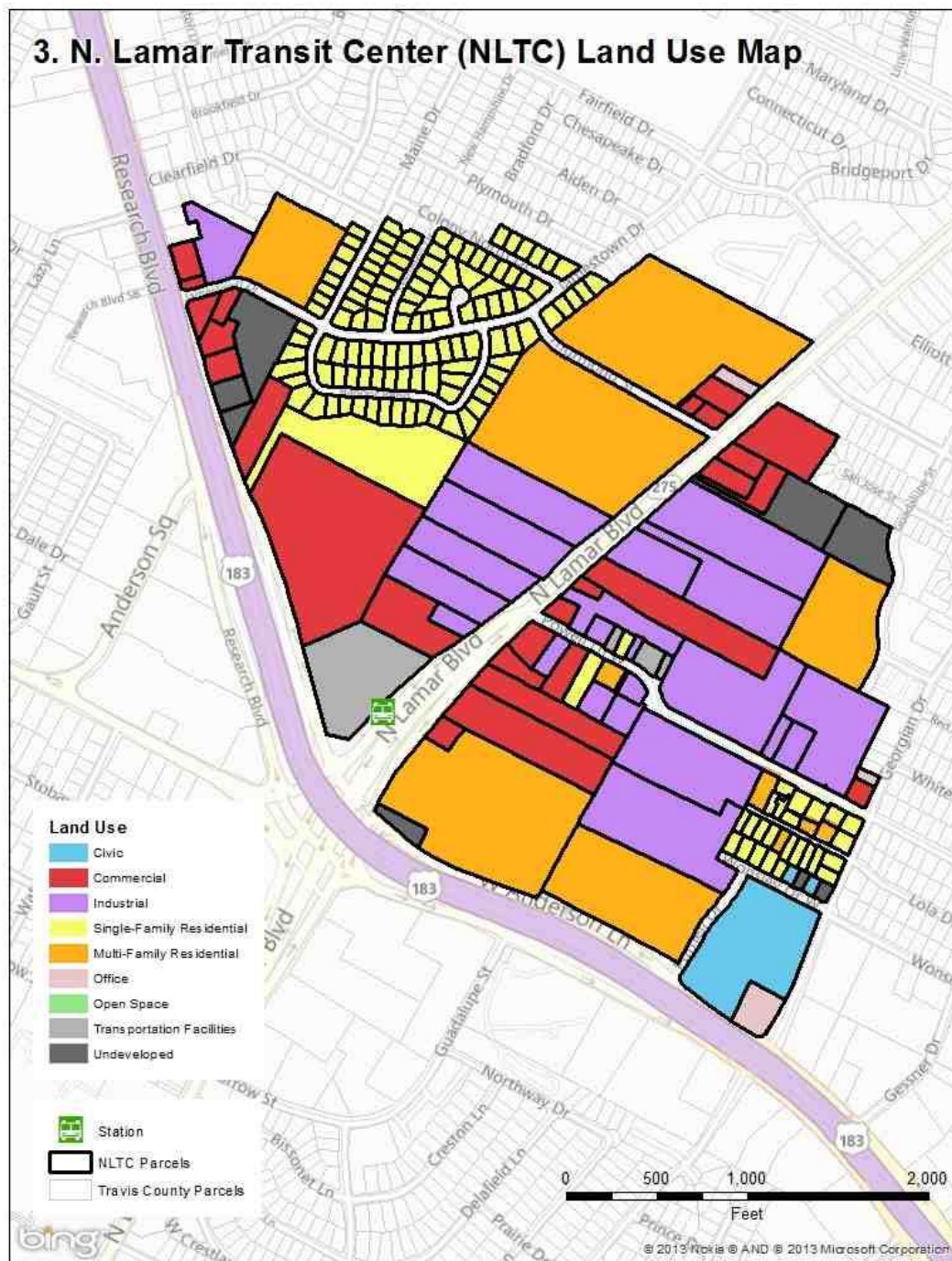


Figure 4-3B: NLTC Station Land Use Map

4. WESTGATE STATION

The Westgate station is located within the existing Westgate shopping center parcel, at the intersection of Western Trails Boulevard and Westgate Boulevard. The shopping center and site analysis area itself is located south of the intersection of US Highway 290, South Lamar Boulevard, and Capital of Texas Highway. Parcels located north of these major freeways and arterials were excluded in the site analysis (see Figure 4-4A). The Westgate station will be the southern-most MetroRapid station for Route 803. In the future, it could serve as a transit center for southwest Austin residents, as well as a gateway station for cities southwest of the Austin area, including Dripping Springs and Bee Cave.

TOD-FEASIBILITY CRITERIA

- 1. Is the site adjacent to a major public transportation system, such as bus rapid transit, light rail, subway, etc.? If not, is a major public transportation stop/station planned for future development?**

Yes; currently, a regular Capital Metro bus route runs through the Westgate shopping center. In the future, a MetroRapid transit station will exist on the site. Although the MetroRapid stations are not currently operational, Route 803 containing the Westgate station will begin running during the summer months of 2014.

- 2. Do population projections support the need for high-density developments?**

Population growth for the City of Austin is estimated to double to approximately 1.6 million people by 2040.⁶³ Although population projections for the City of Dripping Springs are not available, population growth in the recent past for Hays County, within which Dripping Springs is located, suggests similar growth trends to that of the Austin area.⁶⁴ Bee Cave, Texas is located southwest of Austin and is still within the Travis County boundary. Bee Cave can expect to see a portion of the population projections for Travis County, which will add approximately 700,000 people by 2040.⁶⁵

3. Does the site have a significant single-family zoned district within a half-mile radius that may negatively impact development plans?

A single-family residential land use district is located within the site area; this district covers over half of the site area. For this reason, if a TOD were to be developed for the Westgate station, it would need to be concentrated on the northern outer perimeter of the site, along the frontage road of US Hwy 290. In summation, the existing Westgate shopping center would become the new TOD, and the remaining site area would be excluded from redevelopment.

⁶³ City of Austin. "Imagine Austin Comprehensive Plan." City of Austin, updated 2012. ftp://ftp.ci.austin.tx.us/npzd/Austingo/web_IACP_full_reduced.pdf (accessed 2 Nov 2013).

⁶⁴ City of Dripping Springs. "City of Dripping Springs Comprehensive Plan." City of Dripping Springs, updated 2010. http://www.cityofdrippingsprings.com/users/comp_plan/Comp_Plan_FINAL.pdf (accessed 5 Nov 2013).

⁶⁵ Denney, Amy. "CAMPO approves population estimates for 2040." *Community Impact Newspaper*, updated 2013. <http://impactnews.com/austin-metro/northwest-austin/campo-approves-population-estimates-for-2040-long-range-plan/> (accessed 5 Nov 2013).

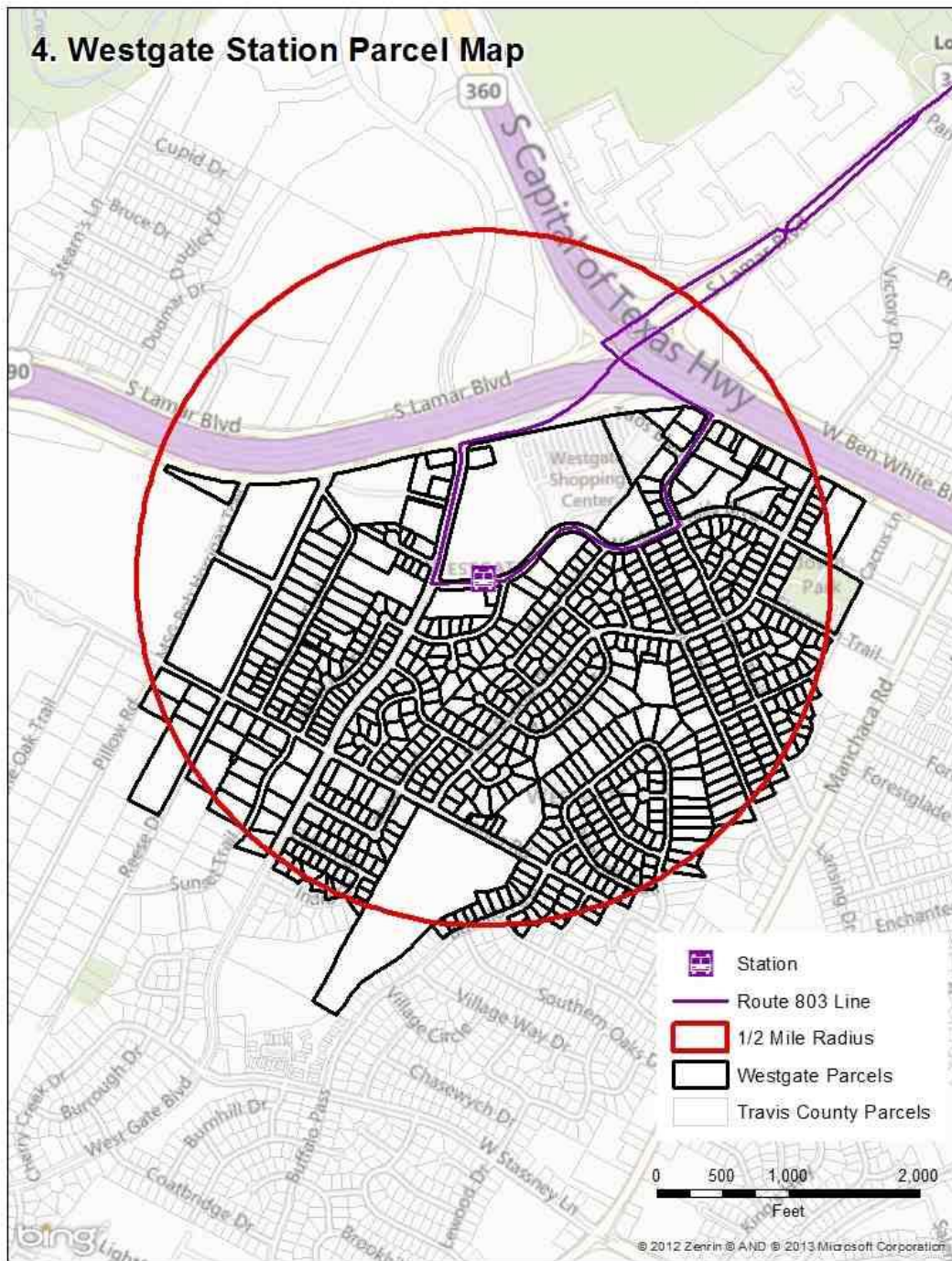


Figure 4-4A: Westgate Station Parcel Map

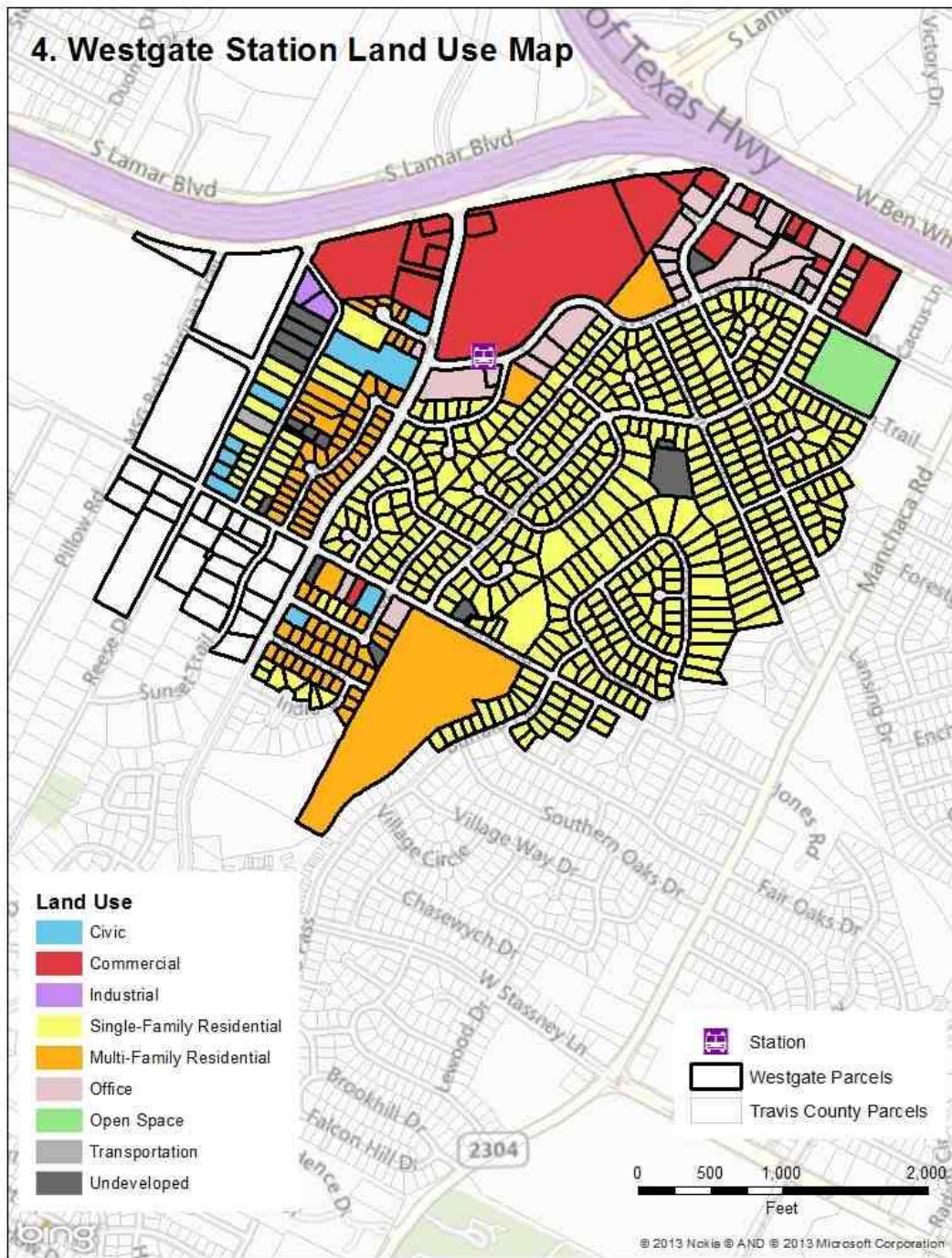


Figure 4-4B: Westgate Station Land Use Map

5. SOUTHPARK MEADOWS STATION

The Southpark Meadows Station will be located west of IH-35 and south of Slaughter Lane. The station is located within the existing Southpark Meadows shopping center, a large, sprawling commercial development. The Southpark Meadows station will be the southernmost MetroRapid station on Route 801 and could potentially serve as the means for public transit for residents of southern Austin and Travis County, as well as become a gateway to the Austin area for residents of northeastern Hays County. The site analysis for a potential TOD development was conducted for the parcels surrounding the MetroRapid station. As shown in Figure 4-5A, the parcels within the half-mile radius of the station that were located east of IH-35 and north of Slaughter Lane were excluded from the site area.

TOD-FEASIBILITY CRITERIA

- 1. Is the site adjacent to a major public transportation system, such as bus rapid transit, light rail, subway, etc.? If not, is a major public transportation stop/station planned for future development?**

Yes; although the MetroRapid stations are not currently operational, Route 801 of the MetroRapid transit system will begin running in January, 2014.

- 2. Do population projections support the need for high-density developments?**

Population growth for the City of Austin is estimated to double by 2040 to approximately 1.6 million people.⁶⁶ Buda, Texas is an adjacent city jurisdiction just south of Austin off IH-35. According to the Buda 2030 Comprehensive Plan,

⁶⁶ City of Austin. "Imagine Austin Comprehensive Plan." City of Austin, updated 2012. ftp://ftp.ci.austin.tx.us/npzd/Austingo/web_IACP_full_reduced.pdf (accessed 2 Nov 2013).

Buda can expect populations to more than quadruple by 2040, from approximately 7,000 people to 33,000 people.⁶⁷ Additionally, the population of the nearby city of Kyle, Texas in Hays County is expected to experience similar rapid growth. According to the projections of the Kyle comprehensive plan, the population is expected to grow at a similar rate to that of Hays County, from their current population of just under 31,000 people to approximately 90,000 people.⁶⁸ The development of a TOD at Southpark Meadows could attract this growth to the area and facilitate public transit use.

3. Does the site have a significant single-family zoned district within a half-mile radius that may negatively impact development plans?

The majority of the site area for the Southpark Meadows station is an existing commercial shopping center. A single-family residential district is under development near the northwest corner of the site (Figure 4-5B), but the district itself makes up a small percentage of the overall site area. This, along with the demonstrated high areas of undeveloped, open space, and existing commercial areas indicate that the existing single-family residential district could have minimal effects on the development of a TOD.

⁶⁷ Halff Associates. "Buda 2030 Comprehensive Plan." City of Buda, updated 2011. <http://tx-buda.civicplus.com/DocumentCenter/View/93> (accessed 5 Nov 2013).

⁶⁸ City of Kyle. "City of Kyle Comprehensive Plan." City of Kyle, updated 2010. http://www.cityofkyle.com/sites/default/files/fileattachments/kyle_comprehensive_plan_final_060110.pdf (accessed 5 Nov 2013).

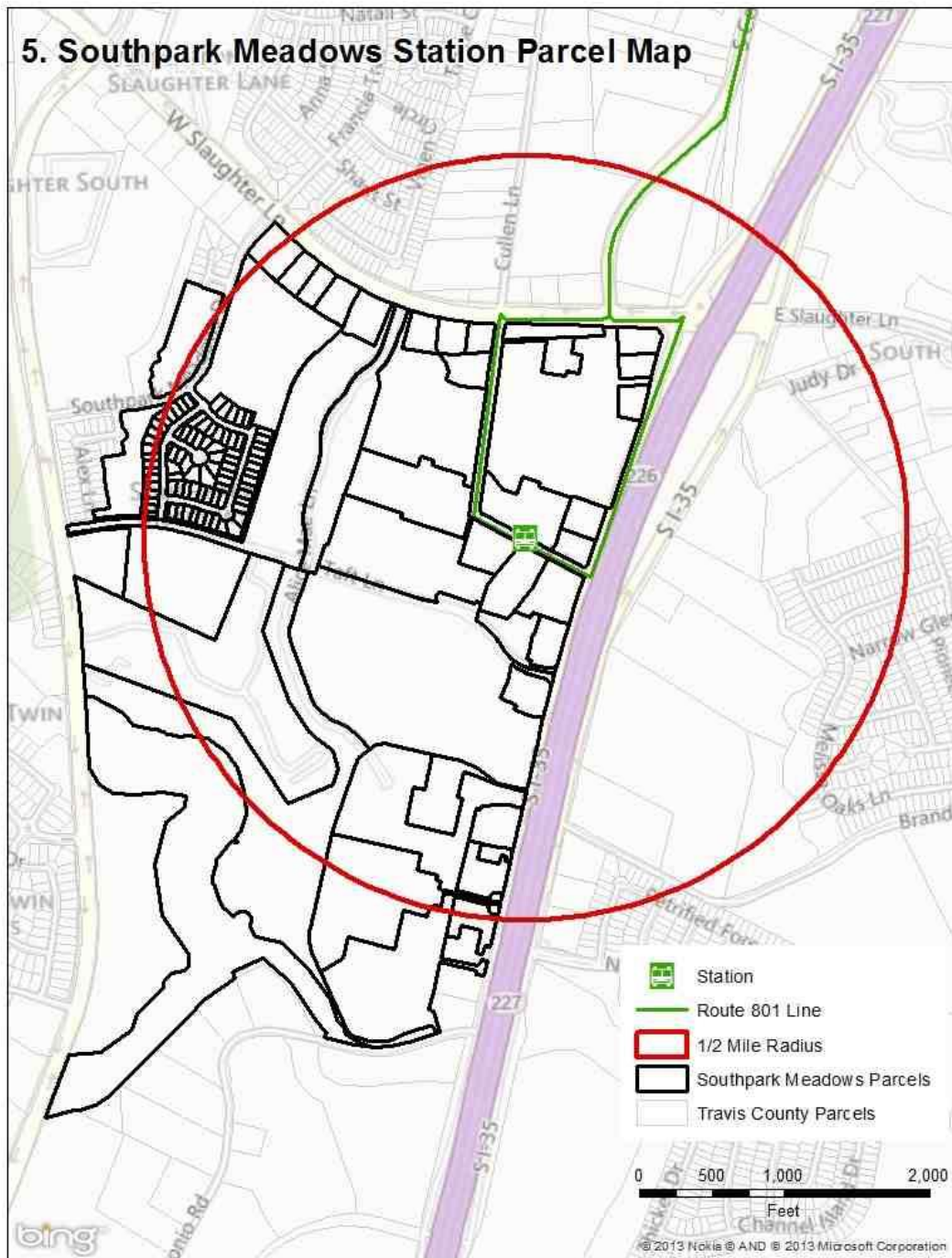


Figure 4-5A: Southpark Meadows Station Parcel Map

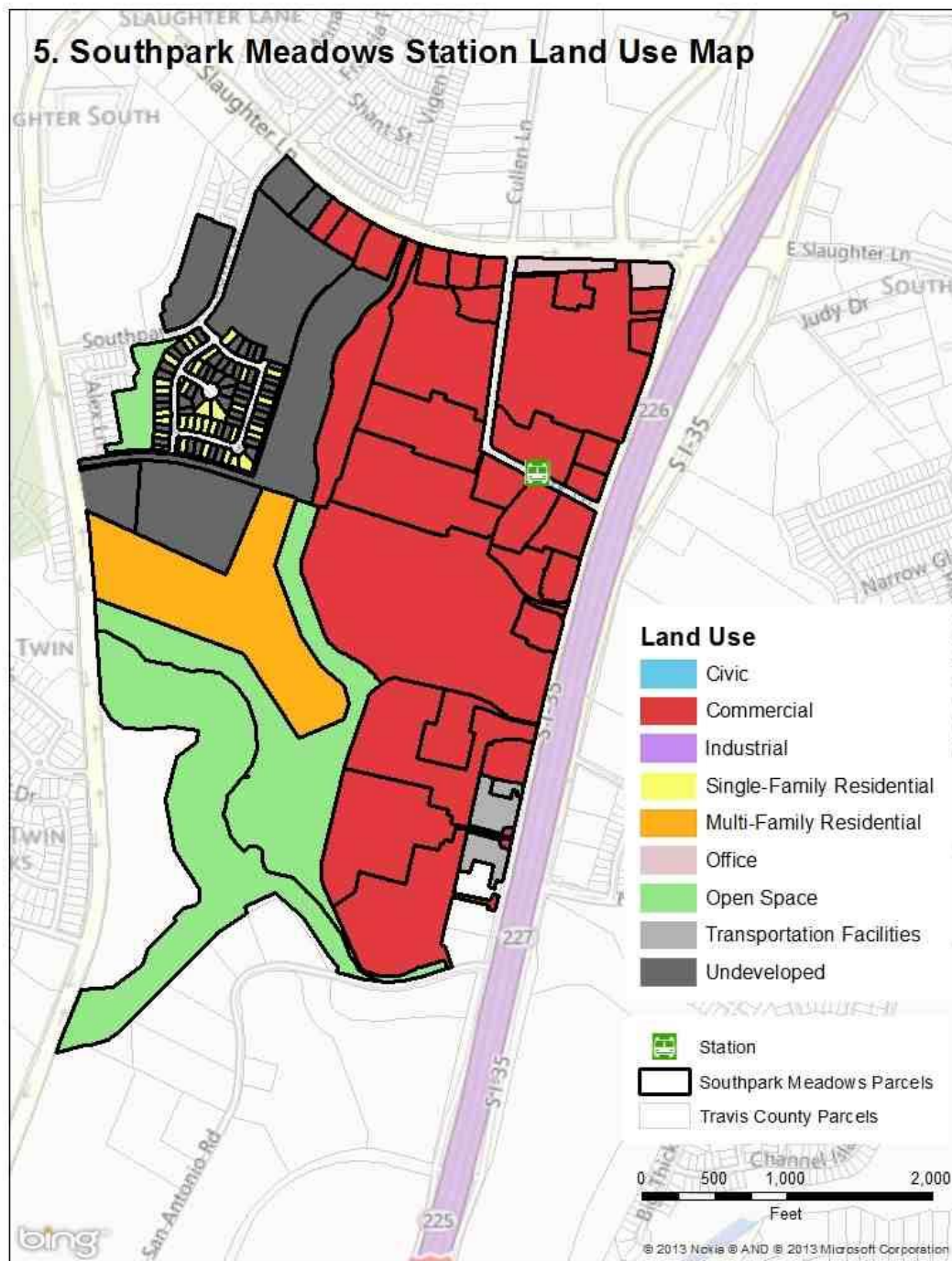


Figure 4-5B: Southpark Meadows Land Use Map

CHAPTER V: Findings and Conclusion

Population projections for the City of Austin could alone support the feasibility of transit-oriented development at the future MetroRapid BRT stations. Additionally considering the population projections for Austin's surrounding areas, including those jurisdictions within Hays County to the south and Williamson County to the north, the need for sustainable growth is apparent.

The site analyses for the five selected MetroRapid stations indicate that four out of the five could feasibly support TOD: Tech Ridge, The Domain, North Lamar Transit Center, and Southpark Meadows. The site area encompassing Westgate Station, however, contained a high concentration of a single-family residential land use, which causes it to not meet the necessary criteria.

The implementation of the MetroRapid transit system represents the beginning of Austin's efforts to evolve from an auto-oriented city to a more sustainable, mass transit-supporting city. Although MetroRapid may not meet the criteria presented within *The BRT Standards 2013* in order to be considered a bus rapid transit system, it has the potential to be improved over time to achieve these goals. Mass rapid public transportation systems are new to Austin, and if the demand is present, strides can be made in the future to pour additional resources into raising the standards of Capital Metro's MetroRapid.

Further public transportation development may reach Austin in the form of urban rail. A measure to begin construction on a light rail public transit system was narrowly

defeated in the November 2000 election.⁶⁹ After more than a decade without any development, Capital Metro is preparing to put a measure for the funding of rail transit to Austin voters again. Construction of an urban rail system is expected to cost about \$275 million, with annual operation costs reaching approximately \$16 million.⁷⁰ After conducting surveys open to all of Austin's citizens, Project Connect recommended that future mass public transit system, urban rail or otherwise, will be focused on the East Riverside and Highland neighborhoods.⁷¹ Capital Metro expects to have urban rail on the ballot in Austin in time for the November 2014 election.⁷²

The cooperation of several different transportation planning groups within Austin including: The City of Austin, Capital Metro, CAMPO, and Lone Star Rail, has led to the creation of Project Connect. Project Connect was formed to tackle public transportation from all levels, both local and regional.⁷³ Mass transit has been made a priority by city officials, policy-makers, and transportation planners. The next step will be to gain the support of Austin residents.

Transit-oriented development is one of many options Austin may choose to use when planning for the city's projected growth. In utilizing TODs as a method of smart

⁶⁹ Clark-Madison, Mike. "Mystery Train: What's Next for Cap Metro After Light Rail's Narrow Defeat at the Polls?" *The Austin Chronicle*, updated 2000. <http://www.austinchronicle.com/news/2000-12-22/79916/> (accessed 8 Nov 2013).

⁷⁰ City of Austin. "Austin's Urban Rail." City of Austin, updated 2013. <http://www.austinurbanrail.com/> (accessed 8 Nov 2013).

⁷¹ McCann, Mac. "Project Connect: It's East Riverside and Highland." *The Austin Chronicle*, updated 2013. <http://www.austinchronicle.com/blogs/news/2013-11-15/project-connect-its-east-riverside-and-highland/> (accessed 16 Nov 2013).

⁷² City of Austin. "Austin's Urban Rail." City of Austin, updated 2013. <http://www.austinurbanrail.com/> (accessed 8 Nov 2013).

⁷³ Project Connect. "Central Texas High Capacity Transit Vision." Project Connect, updated 2013. <http://www.projectconnect.com/vision.php> (accessed 16 Nov 2013).

growth in Austin, city planning officials will facilitate development that is dense and compact, while simultaneously stimulating and encouraging the use of public transportation systems. In addition to the massive growth Austin is projected to experience, neighboring Williamson County is also projected to experience significant growth at a much larger scale.

Sustainable growth is becoming an increasing concern for city planners, government officials, policy-makers, and citizens. Consequently, many of the characteristics of real estate development that became commonplace in the 1950s and 1960s are evolving. Communities characterized by sprawl are being replaced with those characterized by higher density and an emphasis in public transportation. If mass public transit system(s) are expanded and utilized by its residents, Austin and its surrounding areas will see additional benefits in the form of decreased traffic congestion, air toxins, noise pollution, and suburban sprawl.

The introduction of bus rapid transit may only be the beginning of the evolution of Austin's transportation priorities. If Project Connect is successful in implementing even half of what it has planned, Austin could be dramatically transformed to a transit-oriented city.



Figure 5-A: Project Connect Vision Map (Source: Project Connect)

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