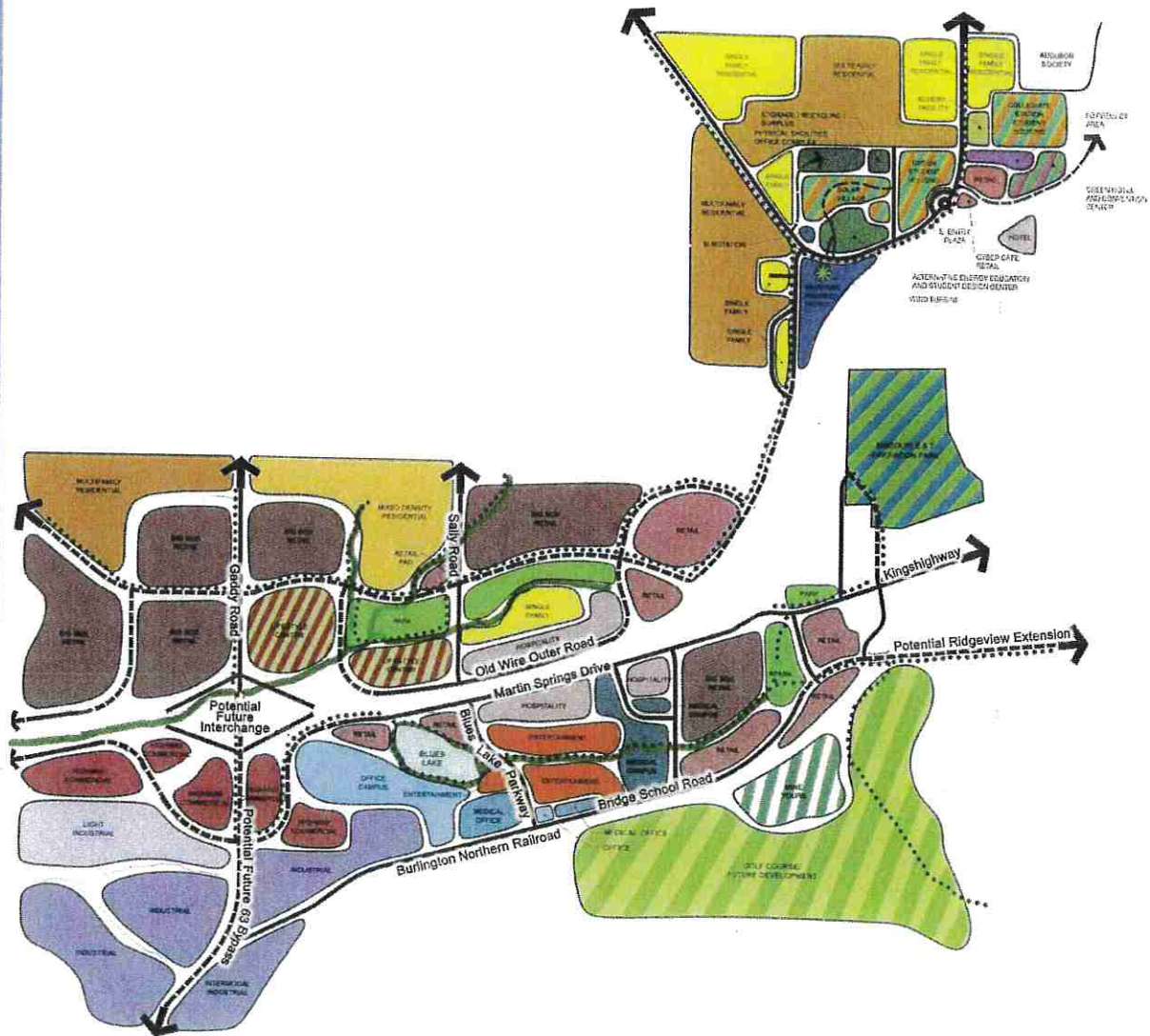


# Rolla West Master Plan



**HNTB**

in association with  
with CM Archer  
Bloomsdale Construction  
Missouri Transportation Institute

January 2009

C

C

C

# Acknowledgements



Preparation of this Master Plan required the input and efforts of many individuals as well as community officials and the public. This report acknowledges and expresses our appreciation for everyone's efforts.

## Community Advisory Committee

William S. Jenks, III, Mayor	Steve Malott, MO S&T
John Butz, City of Rolla	Jim Sowers, RCDC
Stevie Kearsse, Chamber	Dr. Randall Huss, St. Johns Clinic
Randy Verkamp, Phelps County	Jack Dietzmann, Property Owner
John Denbo, PCRMC	Mike Woessner, Broker

## Technical Committee

Steve Hargis, P.E., City of Rolla	Vicki Cason, RMU
John Petersen, City of Rolla	Rodney Bourne, RMU
David Forshee, City of Rolla	Ted Ruth, MO S&T
Robby R. Rakestraw, MoDOT	Keith Strassner, MO S&T
Elizabeth Bax, RREC	

## Consultant Team

### HNTB Corporation

Kip Strauss, AICP  
Brian Comer, AICP  
Mitch Zeller, RLA, ASLA  
Adam Wiechman, RLA, ASLA  
Stephen Ibendahl, RLA, ASLA

### CM Archer

Jeff Meadows, P.E.  
Bryan Parker, P.E.

### Missouri Transportation Institute

Angela B. Rolufs  
Eric Strack  
Hojong Baik

### Bloomsdale Construction

Tom Manion

# Contents



<b>Introduction</b>	
Plan Purpose .....	1
Plan Objectives .....	1
Plan Area .....	1
Study Process .....	1
Plan Goals .....	3
<b>Plan Influences</b>	
Natural Conditions .....	4
Existing Land Use Patterns .....	6
Existing Infrastructure .....	8
Regional and Local Access .....	10
Market Considerations .....	10
<b>Alternatives</b>	
Alternative 1 .....	11
Alternative 2 .....	13
Alternative 3 .....	15
<b>Land Use Plan</b>	
Guiding Principles .....	17
Land Use Plan Map Description .....	17
Land Use Categories and Definitions .....	20
E <sup>3</sup> Campus Development .....	28
<b>Transportation</b>	
Transportation Recommendations - West Side .....	31
Transportation Recommendations - East Side .....	37
<b>Implementation</b>	
Implementation Tasks .....	40
<b>List of Tables</b>	
Table 1: Summary of Conceptual Road Improvement Costs - West Side .....	36
<b>List of Exhibits</b>	
Exhibit 1: Plan Area .....	2
Exhibit 2: Environmental Constraints .....	5
Exhibit 3: Existing Land Use .....	7
Exhibit 4: Infrastructure .....	9
Exhibit 5: Alternative 1 .....	12
Exhibit 6: Alternative 2 .....	14
Exhibit 7: Alternative 3 .....	16
Exhibit 8: Rolla West Land Use Map .....	18
Exhibit 9: Rolla West Inset .....	19
Exhibit 10: E <sup>3</sup> Campus Development Inset .....	30
Exhibit 11: Future Road Network .....	35



## Appendix A

Cost Estimates for Proposed Improvements - West Side .....A-1

### List of Tables

Table 1A: Conceptual Road Improvement Costs .....A-3  
 Table 2A: Bridge School Road Replacement Cost Breakdown .....A-4  
 Table 3A: Kingshighway Extension Cost Breakdown .....A-4  
 Table 4A: Martin Springs Drive Extension Cost Breakdown .....A-5  
 Table 5A: Martin Springs Drive Improvements Cost Breakdown .....A-5  
 Table 6A: Old Wire Road Extension Cost Breakdown .....A-6  
 Table 7A: Old Wire Road Improvements Cost Breakdown .....A-6  
 Table 8A: Gaddy Road Extension Cost Breakdown .....A-7  
 Table 9A: Gaddy Road Improvements Cost Breakdown .....A-7  
 Table 10A: Sally Road Improvements Cost Breakdown .....A-8  
 Table 11A: Vista Drive Improvements Cost Breakdown .....A-8

## Appendix B

Transportation Improvements - East Side .....B-1

### List of Tables

Table 1B: Missouri S&T Research Park Traffic Generation .....B-1  
 Table 2B: Technology Drive from Fairgrounds Road to  
 Technology Drive Preliminary Quantity and Cost Estimate .....B-7  
 Table 3B: Ridgeview Extension Cost Estimate .....B-10  
 Table 4B: Kingshighway Widening - 5 Lane with Center Turn Lane  
 Technology Drive to E. Outer Road/NB On-Ramp Cost Estimate .....B-13  
 Table 5B: Kingshighway Widening - 5 Lane with Center Turn Lane  
 Technology Drive to US 63 Cost Estimate .....B-14  
 Table 6B: Kingshighway Widening - 5 Lane with Raised Median  
 Technology Drive to E. Outer Road/NB On-Ramp Cost Estimate .....B-15  
 Table 7B: Kingshighway Widening - 5 Lane with Raised Median  
 Technology Drive to US 63 Cost Estimate .....B-16

### List of Exhibits

Exhibit 1B: Innovation Park Site Plan .....B-2  
 Exhibit 2B: Existing Traffic .....B-3  
 Exhibit 3B: Innovation Park Internal Road Network Alternative .....B-5  
 Exhibit 4B: Innovation Park Potential Improvement Zones .....B-6  
 Exhibit 5B: Ridgeview Road Extension .....B-8  
 Exhibit 6B: Rolla West Master Plan .....B-9  
 Exhibit 7B: Existing Kingshighway Looking Northeast (Photo) .....B-11  
 Exhibit 8B: 4-Lane Divided Enhancement of Kingshighway  
 Looking Northeast (Photo Rendering) .....B-12  
 Exhibit 9B: 4-Lane with Center Turn Lane Enhancement of  
 Kingshighway Looking Northeast (Photo Rendering) .....B-12

# Introduction



## Plan Purpose

The purpose of the *Rolla West Master Plan* (Plan) is to outline a long-term comprehensive vision for land use, transportation and infrastructure within the Rolla West area. This area is primed for new development and will serve most of the future growth needs for Rolla over the next twenty years. The primary issues driving this opportunity for growth and the need for the Plan include the following:

- The extension of City sanitary sewer and water service to Rolla West;
- A potential fifth I-44 interchange that will provide improved access to the Rolla West area and serve as a significant catalyst for future development; and
- Other planned transportation improvements including a future Route 63 Bypass as well as potential transportation improvements, such as the Highway 72 (Ridgeview) extension, that will improve ease of east/west traffic flow.

## Plan Objectives

To address these issues, the City of Rolla commissioned a Master Plan for the Rolla West area. At the onset of the process, the identified plan objectives were as follows:

- Identify a comprehensive land use vision for Rolla West;
- Coordinate planning efforts with Missouri University of Science and Technology (Missouri S&T), including the new E<sup>3</sup> Campus and Technology Park;
- Define the necessary transportation and infrastructure improvements to support the land use vision; and
- Determine conceptual costs, applicable funding mechanisms and phasing to maximize future growth opportunities.

## Plan Area

The plan area, highlighted (yellow) on the following page (see Exhibit 1 on Page 2), is approximately 1,057 acres or 1.65 square miles. In addition to the Rolla West area, the Plan will address the Missouri S&T E<sup>3</sup> Campus, shown in green, and connections to the Technology Park, shown in blue. Approximately 50% of the plan area is within incorporated Rolla (incorporated areas are shown in the red hatch on Exhibit 1). The remaining plan area is within unincorporated Phelps County and is currently subject to County codes and restrictions.

## Plan Process

Planning is a process by which a community assesses what it is and what it wants to become, and provides an opportunity to make it happen. Specifically, planning guides public policy decisions on land use, infrastructure and public services. In order to be successful, the Plan must address the community's primary issues. Therefore, public participation is essential. The Plan's concepts, direction and final recommendations

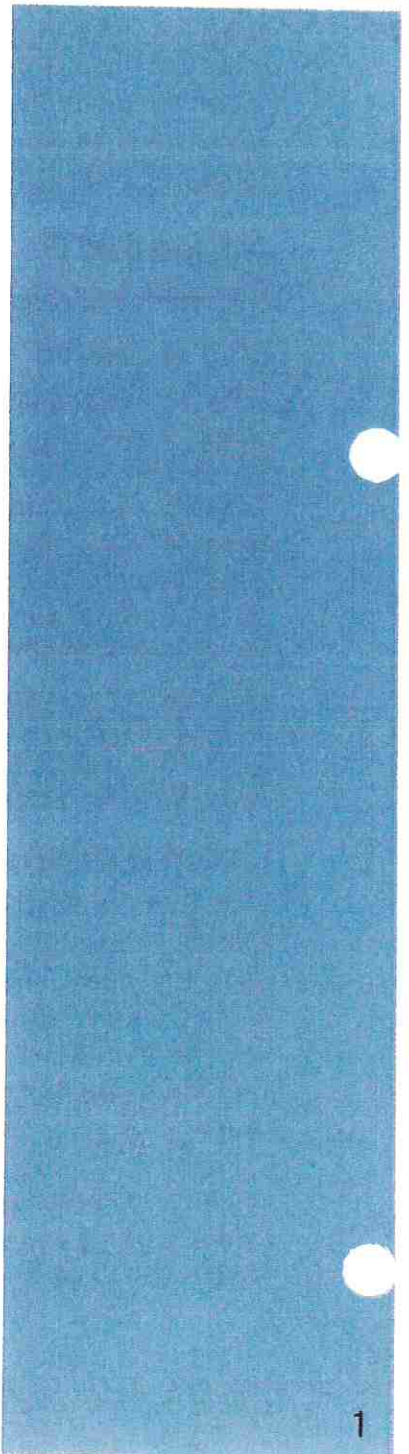
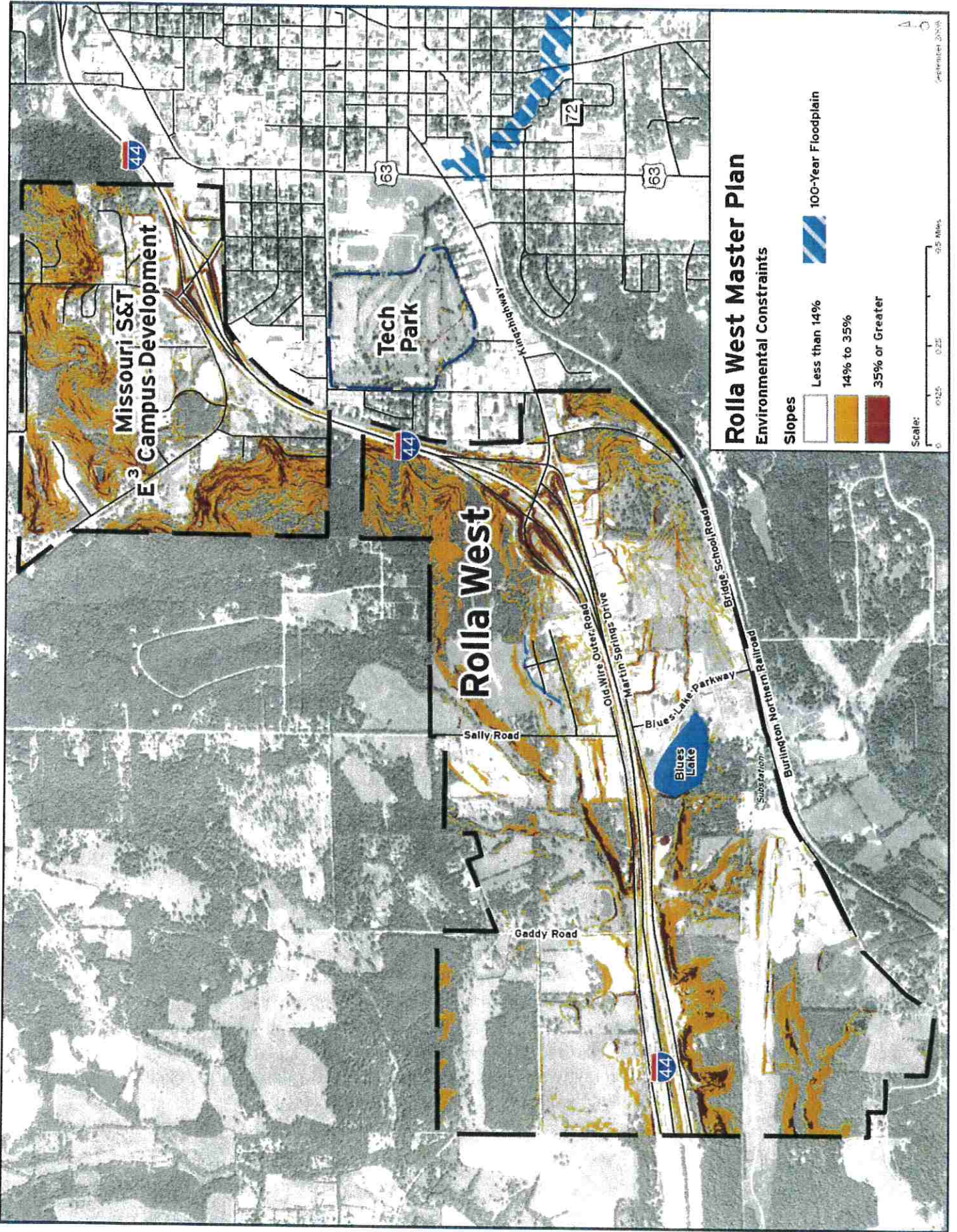


Exhibit 2: Environmental Constraints



# Plan Influences



## **Natural Conditions**

As stated in the *Rolla Comprehensive Plan*, “Rolla residents feel strongly about conserving the area’s natural features, resources and scenic quality.” This sentiment was confirmed through the Rolla West Community Vision Workshop, where participants noted that the natural beauty of the area is what sets Rolla apart from other communities. Preserving the area’s natural features will help maintain Rolla’s identity and desirability as a place to live, work and play.

## **Slopes**

As illustrated in Exhibit 2, on the following page, the dominant natural feature within the plan area is the rolling hills and significant tree stands. Slopes within the plan area vary from gradual to extremely steep. For planning purposes, the following rule of thumb for slopes apply:

- 0 to 7% slopes: easily developable.
- 7 to 15% slopes: somewhat difficult in terms of grading and impacts.
- 15 to 30% slopes: extremely expensive with significant impacts.
- Slopes in excess of 30%: generally considered not developable.

Any significant future development, including provisions for future road connections and a new interchange will require altering the natural landscape through grading which will include cutting into hillsides and/or the filling of valleys and low areas. To preserve the natural character of the area, future development plans should retain as much of the natural topography as possible. Hillsides with significant tree stands, vegetation and natural wildlife habitats should be retained. If these areas are impacted, the development should investigate potential mitigation including but not limited to replacing displaced trees and vegetation where practical. Additionally, where practical, scenic view sheds should be preserved.

## **100-Year Floodplain and Drainage Areas**

The 100-year floodplain is the portion of the drainage basin which is within the one-percent annual chance floodplain. Development in the 100-year floodplain may be appropriate if adequate measures are taken to protect the development from the flood hazards. Currently, the only area within the Rolla West area in the 100-year floodplain is a small drainage area that runs through the residential subdivision in the north central portion of the plan area. South of I-44, Blues Lake was created as a regional detention area and captures a majority of the storm runoff within the southern portion of the plan area. The floodplain and other natural drainage areas should be protected and enhanced through a system of open space corridors and trails that serve as a buffer to environmentally sensitive areas from adjacent development as well as provide opportunities for green belts and pedestrian linkages.





are the result of an inclusive public process that identifies the area's opportunities and proactively addresses its challenges. This process included an interactive three-day Community Visioning Workshop and public open house to address the future of the Rolla West area.

## Community Visioning Workshop

Successful, implementable plans are achieved through fair and open public discussions. One of the most critical challenges within the planning process is achieving consensus within a compressed time frame. This means helping the public understand the trade-offs that come with each possible solution, while meeting the unique challenges and constraints specific to the Rolla West area. It also means effectively working with conflicting visions and values by ensuring candid and productive discussions. These challenges were addressed in a carefully planned and open workshop process. Over three days, rather than weeks or months, the project team lead participants including City staff, community leaders, area stakeholders and the community at-large to understand their needs and values and to develop preliminary concepts and ideas for feedback. A public open house was held to encourage wider public input and to solicit feedback on initial ideas and alternatives generated during the workshop. These plan alternatives, developed during the workshop process, were also posted on the City web site with an interactive web log to encourage additional public input. Based upon this input, a preferred plan concept was identified and organized into a cohesive vision, goals and objectives and recommendations.

## Community Advisory Committee

This committee represented a mixture of property owners, business owners, public officials, residents and interested citizens and provided local insight and direction to City staff and the consultant team.

## Technical Committee

This committee was comprised of members of the consultant team, City staff, utility and service providers as well as representatives from the Missouri Department of Transportation (MoDOT) and provided technical support and guidance to the development of the Plan.

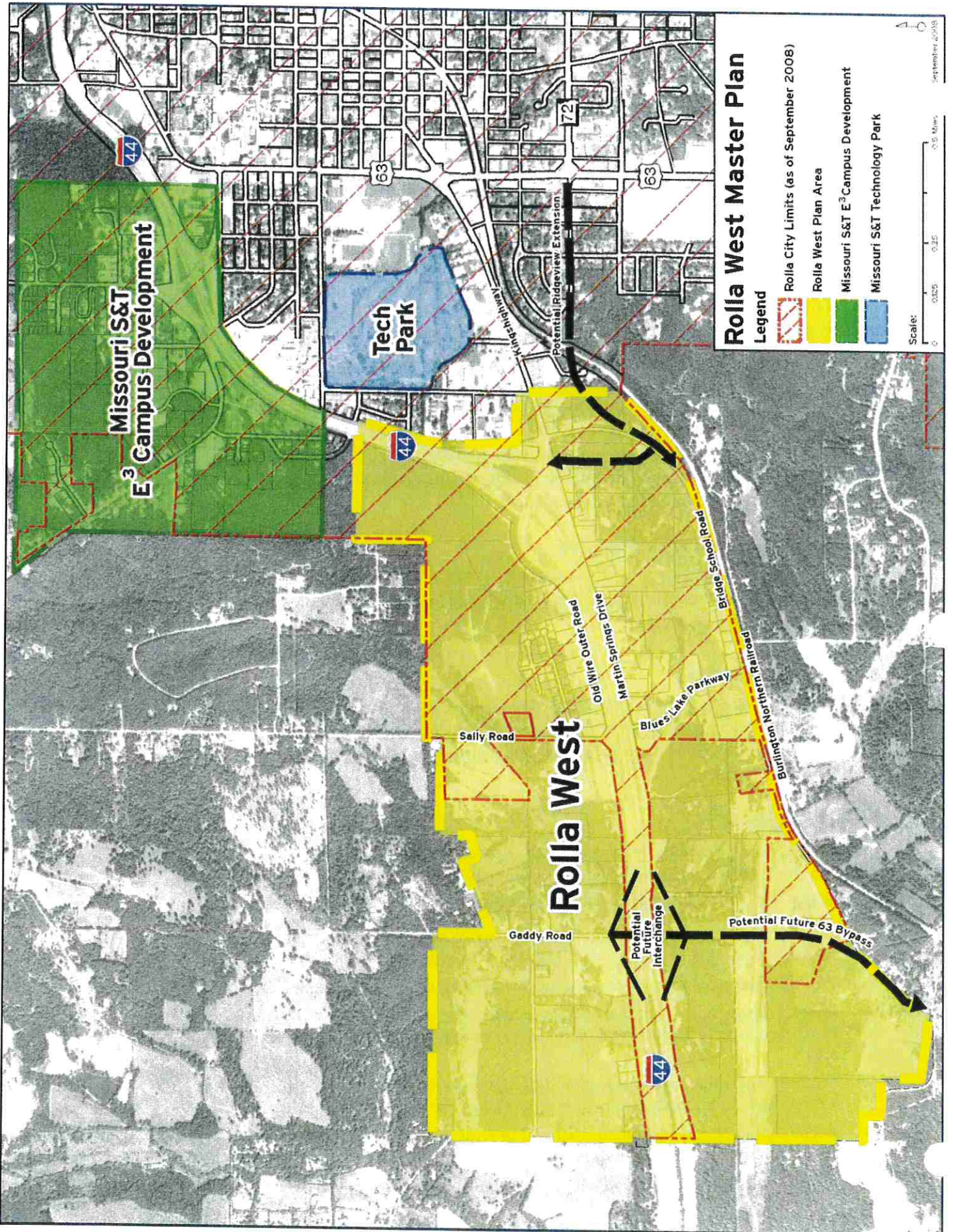
## Plan Goals

The following goal statements were based on the issues, concerns and ideas that were identified during the Community Visioning Workshop. These goals represent the purpose that the Plan is designed to achieve. The Plan will:

- Serve as a major catalyst in solidifying the City of Rolla as the center of commerce, education and health care for south central Missouri.
- Provide a balanced mix of uses that meets the needs of Rolla and the region.
- Identify new development that will pay its' share of the costs of City infrastructure, transportation improvements and services that are necessary to serve the area.
- Promote environmentally sensitive development that harmoniously blends within the natural character and scenic quality of the area.
- Encourage quality development that will provide a positive first and last impression of Rolla.
- Provide a system of pedestrian and bicycle connections to serve the area.



Community Visioning Workshop



## Existing Land Use Patterns

Exhibit 2, on the following page, provides a graphic illustration of the existing land use patterns in the Rolla West area. Descriptions for each of these areas is included below.

### Industrial

Royal Canin operates a pet food plant located in the southwestern portion of the plan area along Bridge School Road. This plant is currently one of the largest employers in Phelps County and plans are underway for potential expansion.

### Commercial/Office

A majority of the commercial/office uses are concentrated along the frontage roads parallel to I-44 (Old Wire Road to the north and Martin Springs Drive to the south). Major uses along these frontage roads include hotels, restaurants, commercial services and office uses. Blues Lake Road, which connects Bridge School Road to Martin Springs Drive, supports a wide range of commercial/office uses and is planned for future business park.

### Medical/Office

St. Johns Clinic is a planned three-story 108,000-square foot facility intended to consolidate medical services in one location. An additional 43,000-square foot facility will provide physical and occupational therapy, sleep laboratory endoscopy, pain management procedures, home medical supply and ambulatory surgery center. The facility will also provide expanded space for all existing Rolla primary care and specialty providers. St. Johns will serve as a major catalyst for new development within the area and will support existing and new medical/office uses between Martin Springs Drive and Bridge School Road including the Bond Clinic (a cancer research and treatment center).

### Single-Family Residential

There is a small single-family residential enclave north of Old Wire Road behind the Holiday Inn Express.

### Multi-Family Residential

There are no existing multi-family uses within the plan area. However, there are existing apartment complexes and student housing in the area surrounding the new E<sup>3</sup> Campus.

### Vacant/Rural/Agriculture

These uses comprise almost 70 percent of all land within the plan area. A majority of the property within the plan area, especially within unincorporated Phelps County, is in large-tracts.

### Other Notable Land Uses

- The Rolla Downtown Airport: Privately owned and operated airfield.
- Missouri S&T Mines: This is a demonstration area for mining technology including safety and rescue techniques.
- Mark Twain National Forest and Ranger Station: Located on the east side of the plan area, this park is home to several structures on the National Register of Historic Places.
- Camp Hallecek: The general area was home to a Civil War Encampment.
- Missouri Department of Transportation (MoDOT) Maintenance Facility.
- Buehler Park.



Existing Martin Springs Drive

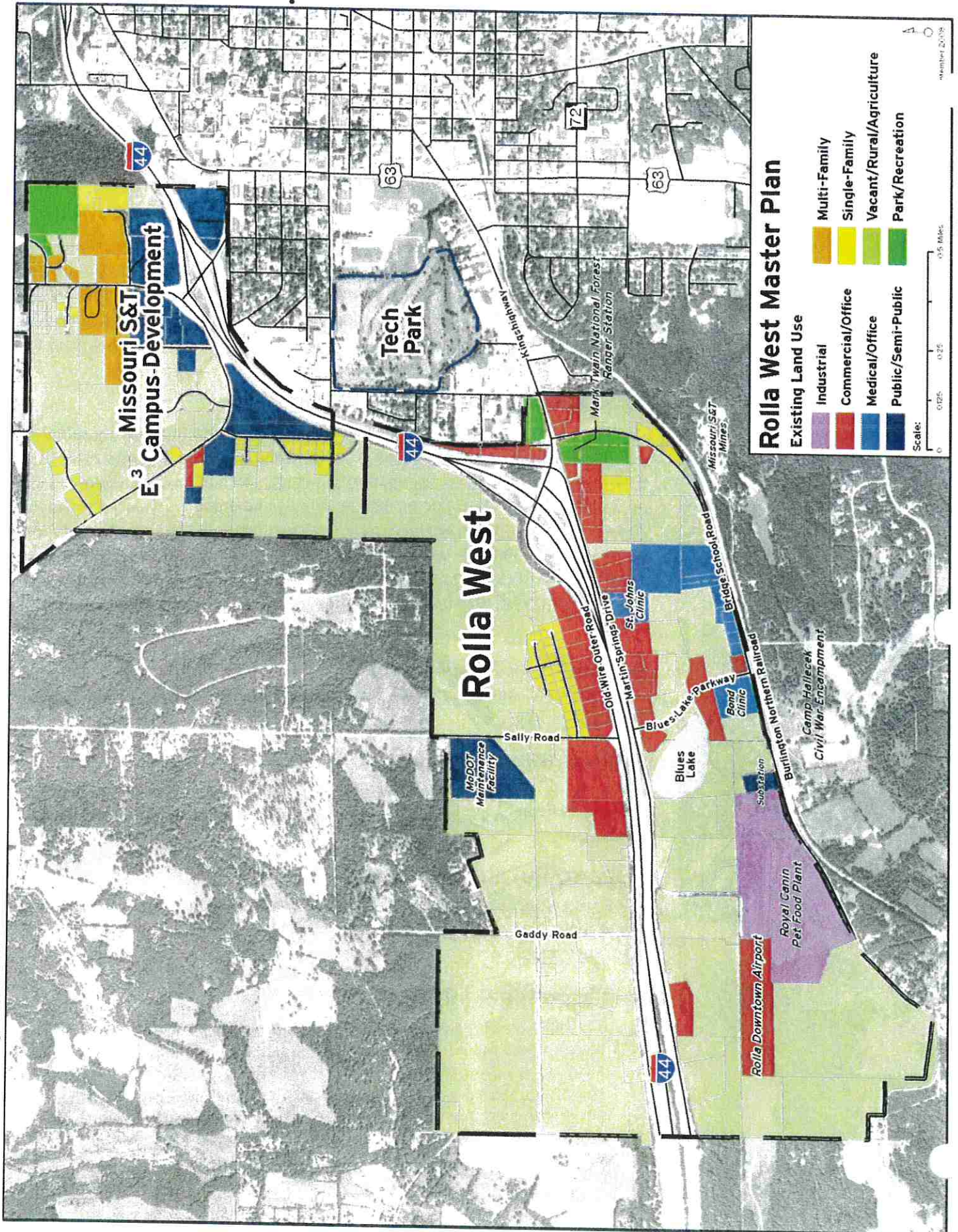


Existing Single-Family Residence



Existing Rural Character

Exhibit 3: Existing Land Use



## **Existing Infrastructure**

Rolla West's growth is heavily dependent on the provision of adequate infrastructure and capacity to support future development. This infrastructure includes provisions for the a sanitary sewer system, potable drinking water, natural gas and electricity. As shown in Exhibit 4, a majority of the plan area is served by sanitary sewer, domestic water and natural gas.

### **Sanitary Sewer**

Exhibit 2 illustrates the existing sanitary sewer line coverage in Rolla West. A main sewer trunk line runs throughout the entire plan area along I-44 with several branch lines extending north and south to serve existing development in the eastern portion of the plan area. The City's current waste water system is supported by user fees. The current user fee is \$3.00 per 1,000 gallons, a rate that is below the average paid throughout Missouri. The City currently maintains three treatment facilities. The Southwest Water Treatment Facility, located on Martin Springs Drive, serves the plan area and has a capacity of .60 MGD (million gallons per day). This treatment plant will be able to manage the anticipated growth within the Rolla West area.

### **Electric System**

The Rolla Municipal Utilities (RMU) is owned by the City of Rolla and provides electric service for residential and commercial customers within the corporate limits of Rolla. RMU will support the development of Rolla West by increasing the capacity and area coverage of transmission lines as needed.

### **Domestic Water**

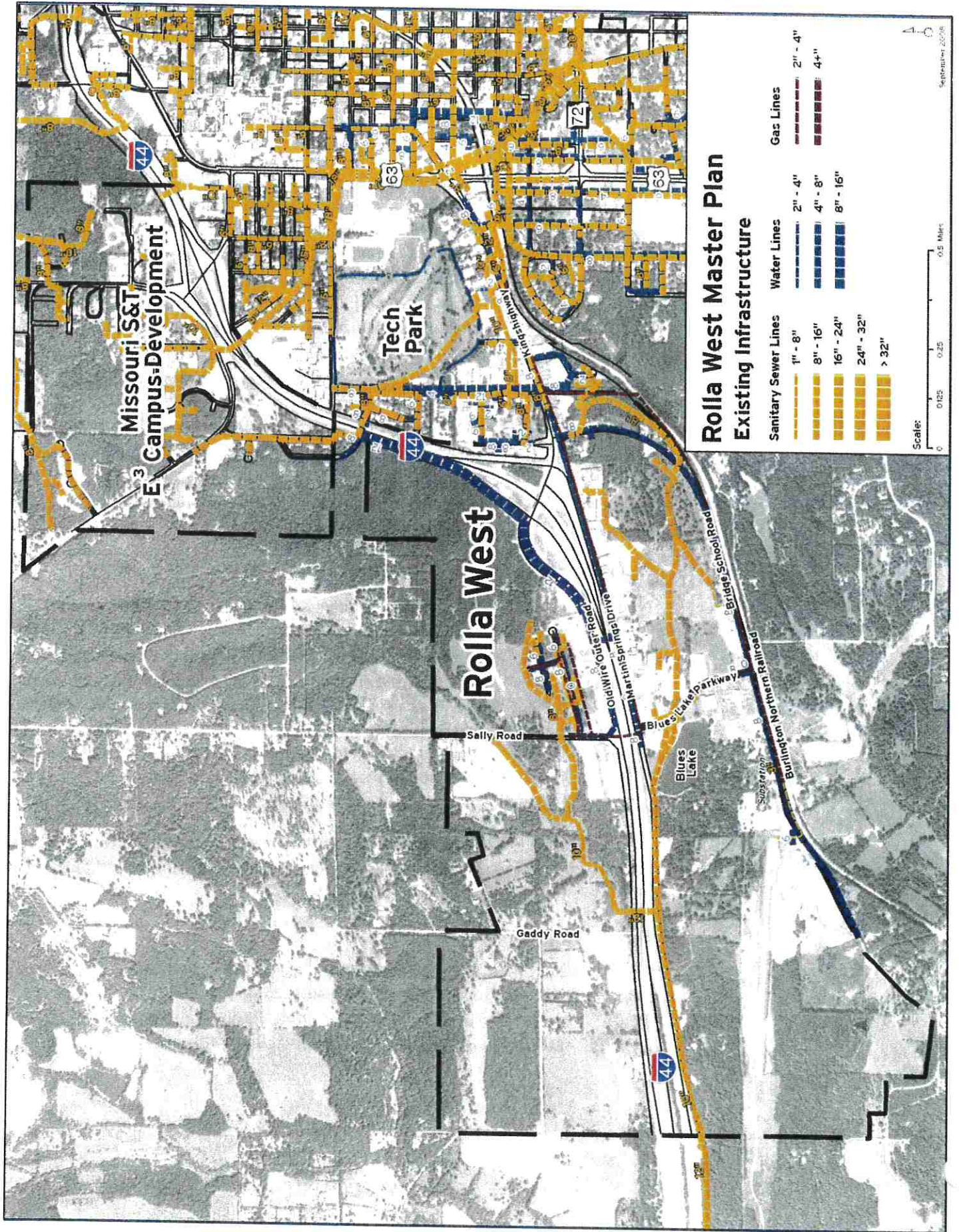
Rolla has access to a more than sufficient supply of high quality underground water. Exhibit 2 illustrates the existing domestic water line coverage in Rolla West. The RMU water system currently has a well capacity of 13.5 MGD with a total storage capacity of 6.95 MG. All wells have fluoridation and chlorination treatment equipment. RMU serves 5,761 residential meters (residential uses consume an average of 1.04 MGD) representing 41 percent of total consumption. There are 834 commercial meters which use an average of 1.14 MGD or 45 percent of total consumption. UMR and other entities use the remaining 14 percent. Total consumption averages 2.52 MGD. RMU can provide approximately five times the current average daily water usage.

The water distribution system could be expanded to 9,330 residential meters, an increase of almost 62 percent above current demand. This existing capacity will be able manage the anticipated growth within the plan area.

### **Natural Gas**

Ameren UE provides natural gas service to Rolla. Most of the City is served through the "City Gate" located at North US 63 near the City limits. Exhibit 2 illustrates the existing gas line coverage in Rolla West. Ameren UE does not anticipate any capacity problems for maintaining Rolla's service levels and providing service to Rolla West.

Exhibit 4: Existing Infrastructure



## **Regional and Local Access**

The plan area is bisected by I-44. The interchange that presently serves the plan area is at Kingshighway on the east side of the plan area. A fifth interchange for I-44 is planned to serve the west-central portion of the plan area. This new interchange will serve as a major catalyst for future development within the Rolla West area.

US 63 is a major north-south route that connects Jefferson City and I-70 to the north and Arkansas to the south. Currently, US 63 is four-lane north of Jefferson City, two-lane between Jefferson City and Rolla, and two-lane south of Rolla. MoDOT is currently studying the potential to widen this section of US 63 to four-lanes between Jefferson City and Rolla. The preferred alternative from the *2002 US 63 Bypass Environment Statement* (EIS) is for the bypass to use I-44 and the new fifth interchange through a new alignment in the western portion of the plan area to connect back to existing US 63 south of Rolla.

Today, a majority of local Rolla traffic will access Rolla West from Kingshighway. Unfortunately, major congestion at the Kingshighway/US 63 intersection is an issue for east-west traffic through the area. An option to address this congestion included a potential Highway 72 extension that would connect to Kingshighway just east of I-44. This concept was included in the 2002 EIS. However, based upon additional input from MoDOT, the City is looking at other options, including extending Highway 72/Ridgeview Road west and connecting to Bridge School Road.

## **Market Considerations**

An economic supply and demand analysis was completed for Rolla to gage the potential for future development within Rolla West. A summary of this analysis is included below:

- Approximately 68% of all retail and restaurant sales in Phelps County happen in Rolla; while Rolla has just 42.5% of the county's population. Rolla also captures 23.8% of retail sales in the seven county region; while Rolla encompasses only 10.3% of that region's population. Clearly, Rolla is the center of retail activity in south central Missouri.
- Rolla maintains a significant negative retail opportunity gap, indicating that the City is drawing in a substantial amount of consumers from outside its market area.
- Based upon the economic analysis, an estimate of an additional 1,057,000 square feet of retail space could be accommodated.
- Types of retail uses that are undeserved within Rolla include food and beverage stores, general merchandise stores and motor vehicle and parts dealers.

For a complete review of this analysis, please refer to "*The Status of Retail Development in Rolla and Phelps County, Missouri*," by Development Strategies Inc., August 17, 2007.

# Alternatives

Preparing conceptual land use alternatives is an exercise designed to identify potential future outcomes. Based on input received at the Community Vision Workshop, three alternatives were prepared for Rolla West to address key issues and to meet the plan goals identified at the onset of the process. These alternatives addressed land uses and development patterns, density distribution and policy implications. Key characteristics for each alternative are summarized on the following pages. Through the public input process, which included a public open house as well as input through the City web site, these alternatives were blended and modified to create a preferred future land use map. The final preferred plan forms the basis for the Land Use Plan and policies which are detailed in the next chapter.

## Alternative 1

### Key Characteristics:

- Improvements to the Kingshighway interchange and extension of Kingshighway to the north side of the plan area. This new Kingshighway section will have the character of a parkway with an adjacent pedestrian/bicycle trail.
- Big-box retail on the north side of the Kingshighway interchange.
- A park with a detention area west of Sally Road.
- Mixed use residential north of the new park which will include a range of residential densities and product types.
- Extension of Highway 72/Ridgeview Road west to Bridge School Road.
- Hospitality (hotel, restaurants, etc) and big-box retail on the south side of the Kingshighway interchange.
- An entertainment district between St. Johns Clinic and the Blues Lake office park.
- A pedestrian/bicycle trail along a greenway that connects the Mark Twain National forest, the new entertainment district and Blues Lake.
- Big-box retail north of the new fifth interchange.
- Highway commercial south of the new fifth interchange.
- Industrial south of the highway commercial along a new Highway 63 Bypass.
- Industrial/commercial as a transition area between the Blues Lake office park and Royal Canin.

### Priorities:

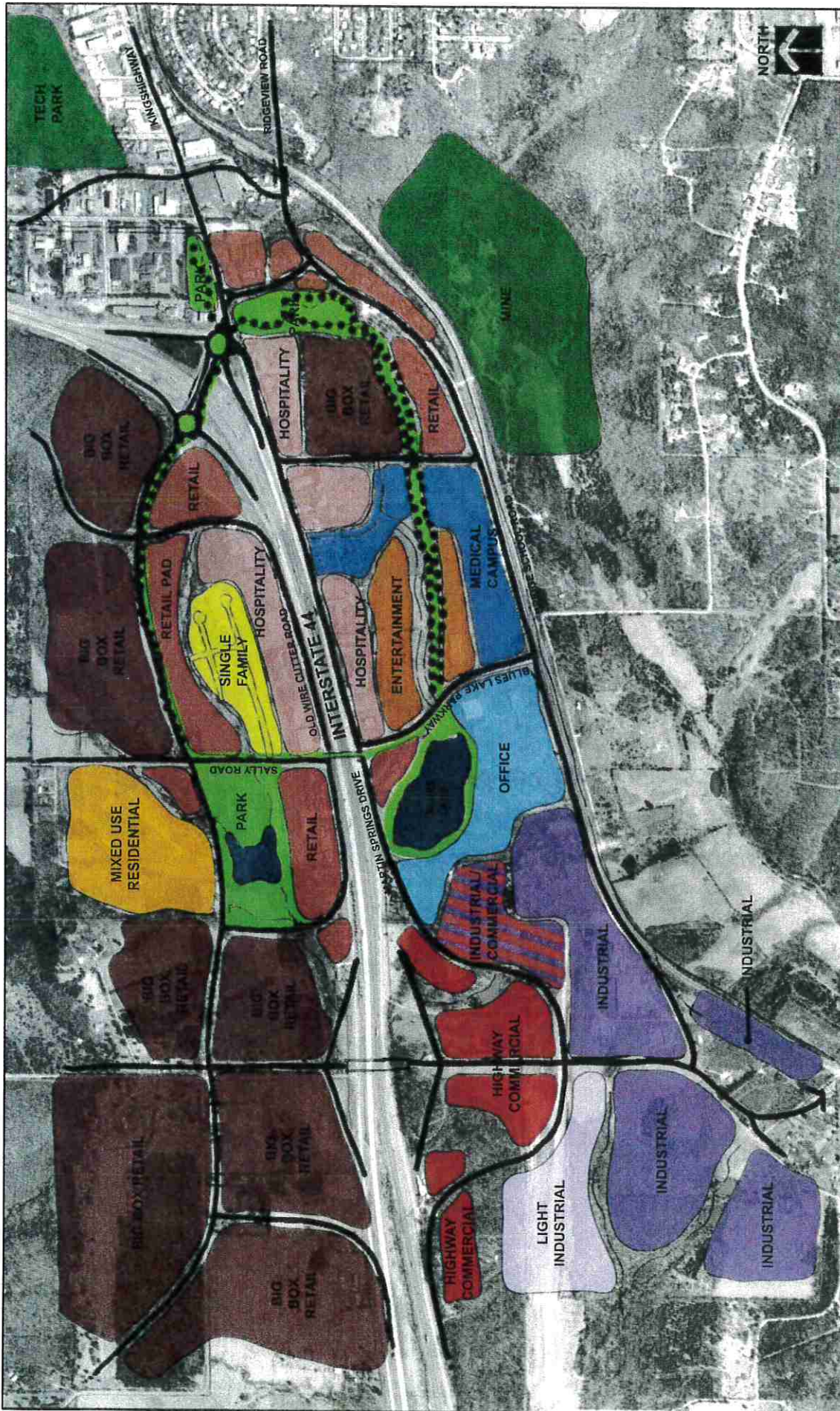
1. Highway 72/Ridgeview Road extension to Bridge School Road
2. Kingshighway interchange improvements
3. Fifth interchange.



















Community Visioning Workshop  
Alternatives Discussion



Exhibit 5: Alternative 1



**LEGEND**

	INDUSTRIAL		HIGHWAY COMMERCIAL		MEDICAL CAMPUS		TECH PARK
	INDUSTRIAL/COMMERCIAL		RETAIL		OFFICE		MINE TOURS
	LIGHT INDUSTRIAL		ENTERTAINMENT		MIXED USE RESIDENTIAL		PARK
	BIG BOX RETAIL		HOSPITALITY		SINGLE FAMILY RESIDENTIAL		GREENWAY
							TRAIL

# Alternative 2



## Key Characteristics:

- Improvements to the Kingshighway interchange and extension of Kingshighway to the north side of the plan area. This new Kingshighway section will have the character of a parkway with an adjacent pedestrian/bicycle trail.
- Inline retail south of the Kingshighway extension to serve as a buffer between the existing single-family residential and proposed big-box retail to the north.
- A park west of Sally Road surrounding by retail fronting Sally Road, Gaddy Road and I-44.
- Mixed use residential, office and retail north of the new park.
- Extension of Highway 72/Ridgeview Road west to Bridge School Road.
- Big-box retail on the south side of the Kingshighway interchange extending all the way south of Bridge School Road.
- Existing hospitality areas remain along Old Wire Road and Martin Springs Drive.
- An expanded medical campus area around the St. Johns Clinic.
- Office/campus surrounding Blues Lake and Blues Lake Parkway.
- A pedestrian/bicycle trail along a greenway that connects the Mark Twain National forest, the new entertainment district and Blues Lake.
- Big-box retail north of the new fifth interchange.
- Multi-family residential north of the big-box retail to serve as a transition to the residential areas.
- Highway commercial and retail south of the new fifth interchange.
- Highway commercial and light industrial east of a new US 63 Bypass
- Royal Canin industrial area expands to meet future needs.
- Missouri S&T Mine area is open to tours to demonstrate new mine technologies, safety and rescue techniques.

## Priorities:

1. Highway 72/Ridgeview Road extension to Bridge School Road
2. Fifth interchange
3. Kingshighway interchange improvements

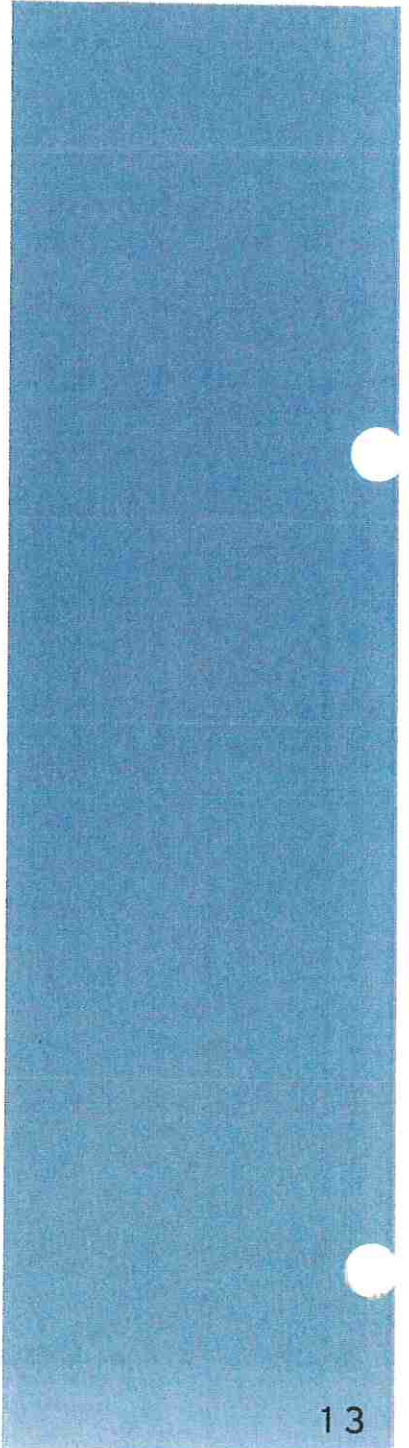
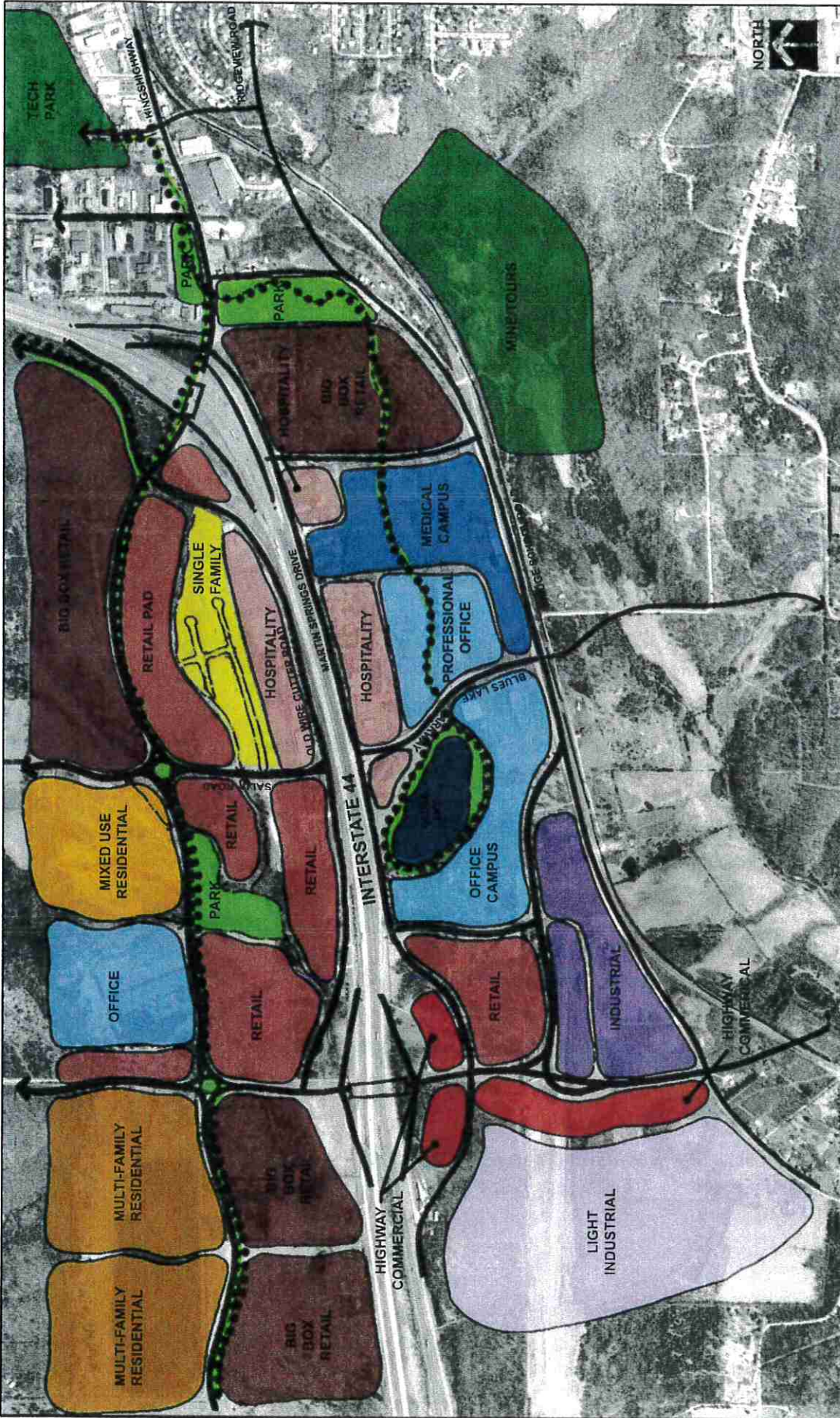



















Exhibit 6: Alternative 2



**LEGEND**

	INDUSTRIAL		RETAIL		OFFICE		TECH PARK		GREENWAY
	LIGHT INDUSTRIAL		ENTERTAINMENT		MIXED USE RESIDENTIAL		MINE TOURS		TRAIL
	BIG BOX RETAIL		HOSPITALITY		MULTI-FAMILY RESIDENTIAL		PARK		
	HIGHWAY COMMERCIAL		MEDICAL CAMPUS		SINGLE FAMILY RESIDENTIAL				

# Alternative 3



## Key Characteristics:

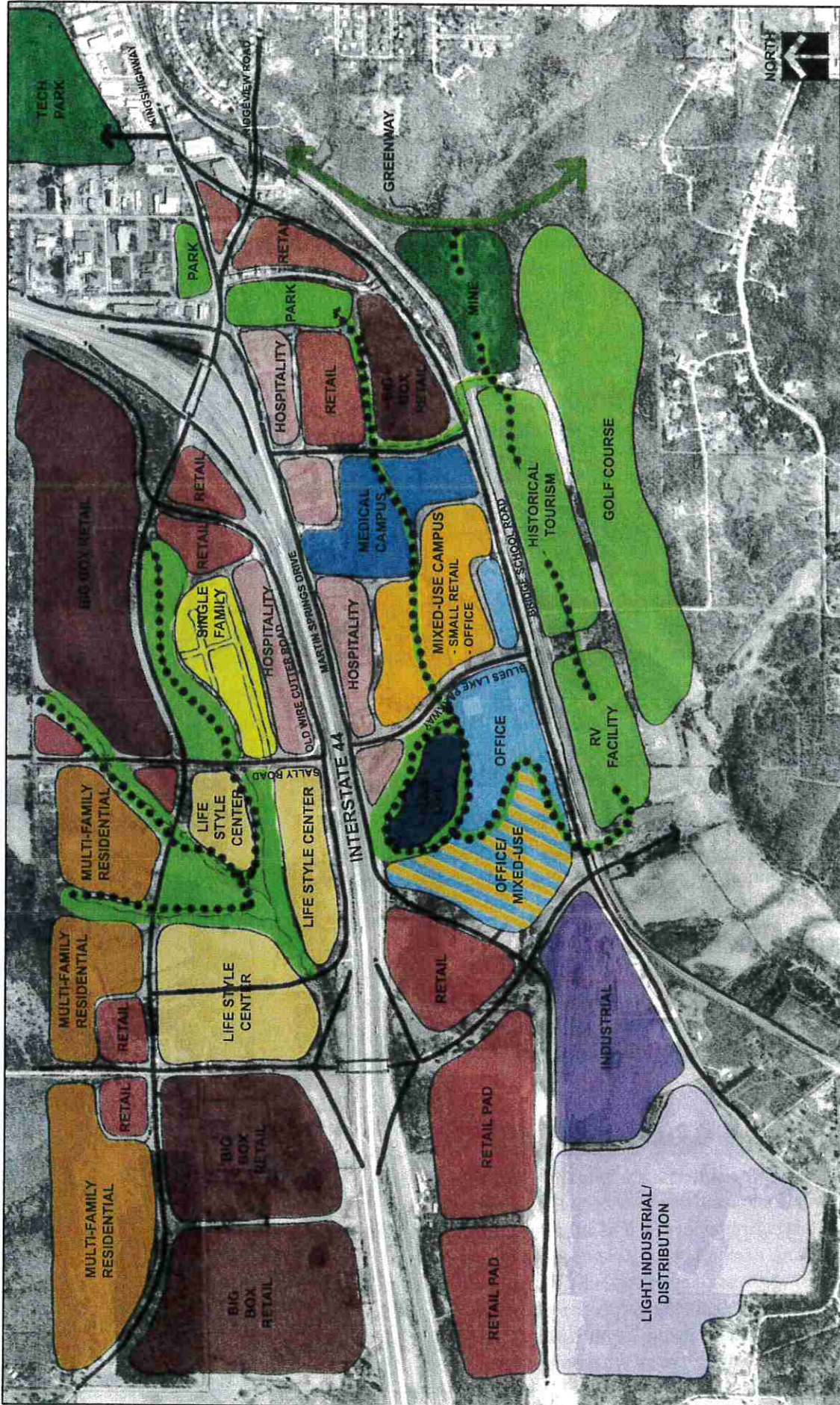
- Improvements to the Kingshighway interchange and extension of Kingshighway to the north side of the plan area.
- Retail pad sites and big-box north of the Kingshighway interchange.
- Expanded green/open space to buffer existing single-family residential area with the new retail pad and big-box. All green/open space buffers will include a connected pedestrian/bicycle trail.
- A lifestyle center (a mixed use commercial development that combines the traditional retail functions of a shopping center with the leisure amenities and specialty services not found typical commercial centers) between Sally Road and Gaddy Road. This center will attract uses and services not currently provided in Rolla.
- Multi-family residential north of the Kingshighway extension with retail pads at the intersections.
- Bog-box retail north of the new fifth interchange.
- Extension of Highway 72/Ridgeview Road extends northwest connecting to the Kingshighway interchange.
- A new greenway and trail along the ridgeline bordering the southeast portion of the plan area.
- A combination of retail and big-box retail south of the Kingshighway interchange. Existing hospitality areas remain along Old Wire Road and Martin Springs Drive.
- An expanded medical campus area around the St. Johns Clinic.
- Mixed-use campus between St. Johns Clinic and Blues Lake Parkway. This area would allow a medical offices as well as ancillary retail including but not limited to drug stores, convenience retail, restaurants, etc.
- Office and office/mixed use west of Blues Lake and Blues Lake Parkway.
- Retail pads south of the new fifth interchange.
- Royal Canin industrial area expands to meet future needs.
- Light industrial area to the west of Royal Canin.
- Missouri S&T mine area is open to tours to demonstrate new mine technologies, safety and rescue techniques.
- Historic tourism area to attract visitors to the Camp Hallecek Civil War encampment.
- A high-end recreational vehicle facility west of Camp Hallecek.
- Potential golf course to the south of Camp Hallecek.
- A pedestrian/bicycle trail along a greenway that connects the Mark Twain National forest, big-box retail, medical campus, Blues Lake as well as Camp Hallecek and the recreational vehicle facility.

## Priorities:

1. Highway 72/Ridgeview Road extension to Bridge School Road
2. Fifth interchange
3. Kingshighway interchange improvements



Exhibit 7: Alternative 3



- LEGEND**
- |                    |                |                          |                          |               |          |
|--------------------|----------------|--------------------------|--------------------------|---------------|----------|
| INDUSTRIAL         | INDUSTRIAL     | OFFICE/ MIXED USE        | OFFICE/ MIXED USE        | SINGLE FAMILY | GREENWAY |
| LIGHT INDUSTRIAL   | HOSPITALITY    | MIXED USE CAMPUS         | MIXED USE CAMPUS         | TECH PARK     | TRAIL    |
| BIG BOX RETAIL     | MEDICAL CAMPUS | MULTI-FAMILY RESIDENTIAL | MULTI-FAMILY RESIDENTIAL | MINE TOURS    |          |
| HIGHWAY COMMERCIAL | OFFICE         | LIFESTYLE CENTER         | LIFESTYLE CENTER         | PARK          |          |

# Land Use Plan

This chapter provides a guide for future development within the Plan Area which balances protection of the area's natural character and infrastructure considerations with the need to improve economic conditions. The land use recommendations represent the community's desire to promote quality development that will meet Rolla's growth needs for the next twenty years. Both community leaders and the public recognize the importance of economic development in providing amenities and jobs for residents as well as a solid tax base for services and infrastructure.

## Guiding Principles

### **1. Fiscally Sustainable Development**

New development within Rolla West must pay for itself, that is, not rely on general City funds to pay for new roads and infrastructure upgrades. Currently, there is no funding identified in the Capital Improvements Program (CIP) for additional infrastructure for the area. Therefore, City revenues generated within the area must sustain all improvements and services provided to the area.

### **2. Economic Growth**

New development within Rolla West will support a majority of the growth needs for the City over the next twenty years and serve as a major catalyst in solidifying the City of Rolla as the center of commerce, education and health care for south central Missouri.

### **3. Quality Development**

Rolla West will serve as a gateway to the City. New development within Rolla West should be of a high quality to provide a positive first and last impression.

### **4. Scenic Quality and the Natural Environment**

New development should retain as much of the natural topography, existing tree stands and natural vegetation as possible. Where practical, scenic view sheds should be protected and enhanced.

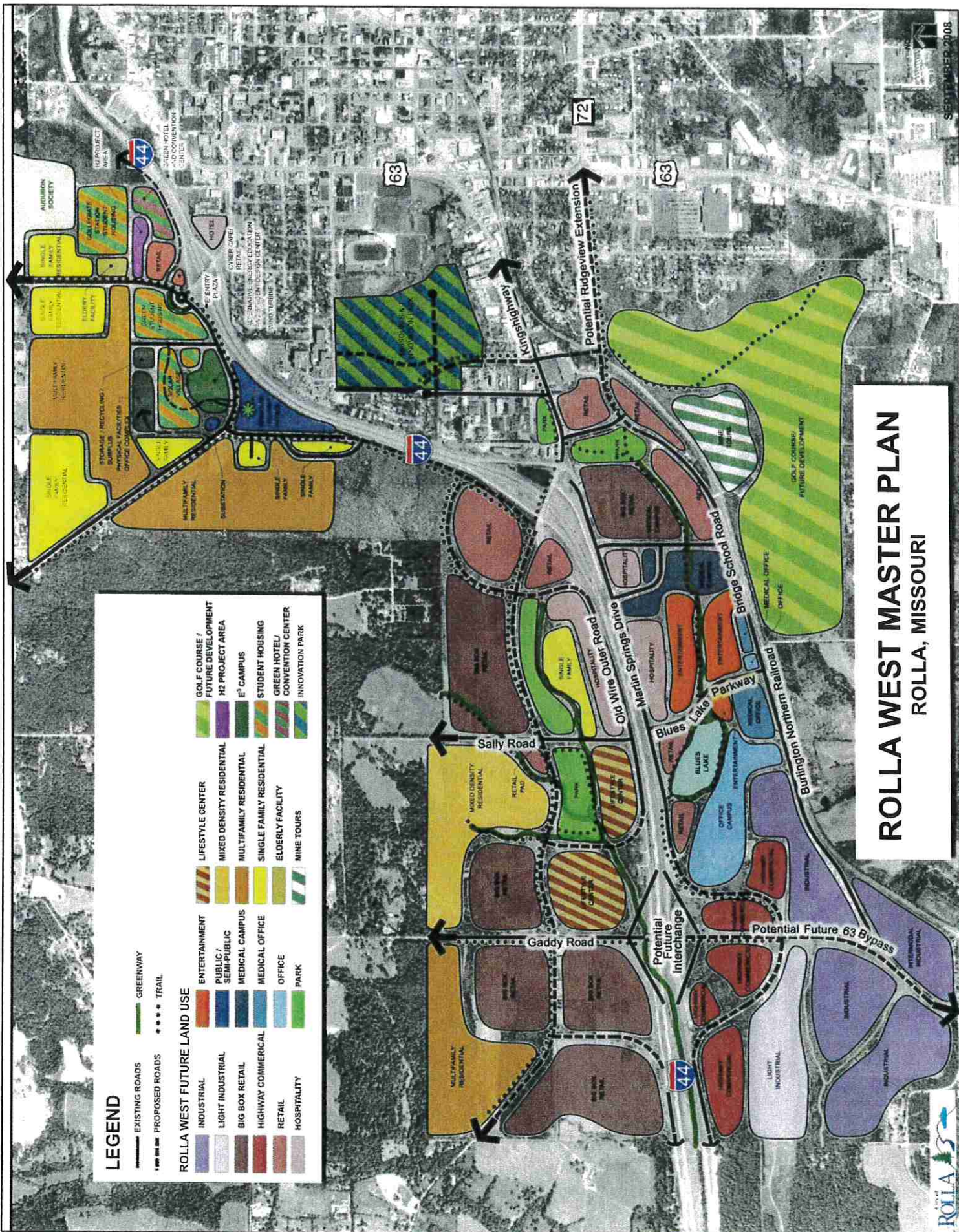
### **5. Walkable Development**

New development should be connected and accessible through an integrated network of pedestrian and bicycle trails. These connections should not only occur within the plan area, but also provide connections to adjacent areas including the Missouri S&T Main Campus, E3 Campus, Technology Park as well as neighborhoods in east Rolla.

## Land Use Plan Map Description

Upon adoption, the Rolla West Land Use Plan Map (on the following page) will serve as a guide for development decisions within the Rolla West area. The land use designations are for planning purposes. The land use plan and categories may correspond to certain zoning districts, but do not represent zoning or a change to existing zoning. Plan classifications may be amended through the Plan amendment process. Zoning designations remain as currently recorded and show how the property may currently be used. Zoning may be changed only through the appropriate rezoning process, which includes a public hearing related to the specific property. The land use categories and definitions are described on the preceding pages.

Exhibit 8: Rolla West Land Use Map



**LEGEND**

- EXISTING ROADS
- - - PROPOSED ROADS
- GREENWAY
- TRAIL

**ROLLA WEST FUTURE LAND USE**

- |                    |                      |                           |                                  |
|--------------------|----------------------|---------------------------|----------------------------------|
| INDUSTRIAL         | ENTERTAINMENT        | LIFESTYLE CENTER          | GOLF COURSE / FUTURE DEVELOPMENT |
| LIGHT INDUSTRIAL   | PUBLIC / SEMI-PUBLIC | MIXED DENSITY RESIDENTIAL | H2 PROJECT AREA                  |
| BIG BOX RETAIL     | MEDICAL CAMPUS       | MULTIFAMILY RESIDENTIAL   | E <sup>3</sup> CAMPUS            |
| HIGHWAY COMMERCIAL | MEDICAL OFFICE       | SINGLE FAMILY RESIDENTIAL | STUDENT HOUSING                  |
| RETAIL             | OFFICE               | ELDERLY FACILITY          | GREEN HOTEL / CONVENTION CENTER  |
| HOSPITALITY        | PARK                 | MINE TOURS                | INNOVATION PARK                  |

**ROLLA WEST MASTER PLAN**  
 ROLLA, MISSOURI



SEPTEMBER 2008

Exhibit 9: Land Use Map (Rolla West Inset)



**LEGEND**

- INDUSTRIAL
- ENTERTAINMENT
- LIFESTYLE CENTER
- MINE TOURS
- EXISTING ROADS
- PROPOSED ROADS
- GREENWAY
- TRAIL
- LIGHT INDUSTRIAL
- HOSPITALITY
- MIXED DENSITY RESIDENTIAL
- GOLF COURSE / FUTURE DEVELOPMENT
- PARK
- BIG BOX RETAIL
- MEDICAL CAMPUS
- MULTIFAMILY RESIDENTIAL
- SINGLE FAMILY RESIDENTIAL
- HIGHWAY COMMERCIAL
- MEDICAL OFFICE
- OFFICE
- RETAIL
- OFFICE
- TECH PARK



## Land Use Categories and Definitions

The following land use descriptions serve as a guide for future growth and development within Rolla West by outlining recommended uses and densities for each category. The land use designations are for planning purposes and do not represent a change to existing zoning.

### Industrial

Industrial uses comprise approximately 114 acres accounting for 13 percent of the plan area (excluding open space, right-of-way, etc). Allows businesses featuring industrial processing, manufacturing, heavy truck traffic, excessive noise, potentially noxious uses and outdoor storage. These uses are the least compatible with residential developments and should be encouraged to locate where such uses already occur.

- **Primary Uses**

- Heavy manufacturing
- Processing
- Large-scale warehousing
- Distribution
- Outdoor storage
- Salvage
- Mining/mineral extraction

- **Secondary Uses**

- Light manufacturing

- **Recommended Density**

- No maximum density

- **Required Infrastructure**

- Access to central sewer
- Access to an adequate water supply
- Access to I-44 and/or future US 63 Bypass and the Burlington Northern Santa Fe Railroad (BNSF) rail line.
- Wide turn bays and access improvements for trucks. A traffic study will be required to determine the need for intersection controls and needed improvements to the local road network

### Light Industrial

Light industrial uses comprise approximately 35 acres accounting for four percent of the plan area (excluding open space, right-of-way, etc). These areas are intended to serve small-scale and non-polluting industries as well as industrial-related business parks and offices.

- **Primary Uses**

- Small-to-medium scale warehousing
- Industrial-related office parks

- **Secondary Uses**

- Limited related commercial and service uses such as truck stops, service stations, convenience stores, etc.

- **Recommended Density**

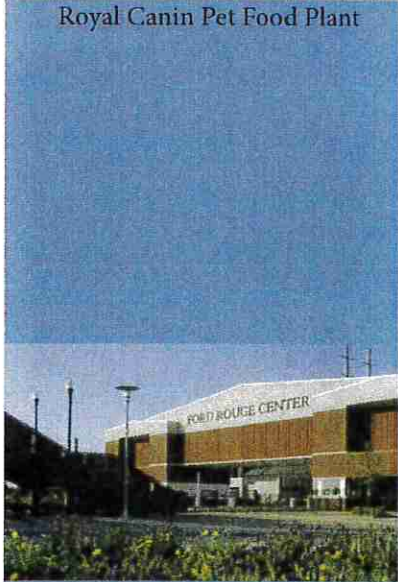
- Maximum Floor to Area Ratio (FAR): 0.5

- **Required Infrastructure**

- Access to central sewer
- Access to I-44 and/or future US 63 Bypass or major arterial road
- Designated turn lanes and access improvements along highways and/or arterial roads. A traffic study will be required to determine the need for intersection controls and needed improvements to the local road network



Royal Canin Pet Food Plant



Light Industrial Example

## Big Box Retail

Big box retail and associated uses comprise approximately 173 acres accounting for 20 percent of the plan area. These large-scale commercial uses are intended to provide goods and services on a regional scale. Uses typically include retail anchor stores with accessory commercial pads.

- **Primary Uses:**
  - Includes regional retail anchors (usually a national chain) that provide a variety of general merchandise, grocery, apparel, appliances, household goods, hardware, etc.
- **Secondary Uses:**
  - Complimentary retail including sit-down restaurants, drive-through restaurants, specialty stores, banks, drug stores, service stations, convenience stores, general services, professional office, etc.
- **Recommended Density**
  - No maximum density
  - The anchor store and associated retail/office pad sites should be at least a combined 150,000 square feet
- **Required Infrastructure**
  - Access to gravity sewer
  - Access to I-44 or an improved arterial road
  - A traffic study will be required to determine access improvements such as turn lanes, intersection controls, etc.
  - Minimum 4-foot pedestrian path with landscape buffer and pedestrian lighting from parking areas to buildings
  - Minimum 8-foot pedestrian connection from the development to the nearest sidewalk/trail

## Highway Commercial

Highway commercial uses comprise approximately 43 acres accounting for five percent of the plan area. These areas are intended to accommodate commercial services which are accessible by automobiles and trucks, require extensive outdoor storage or display areas as well as extensive parking and loading areas.

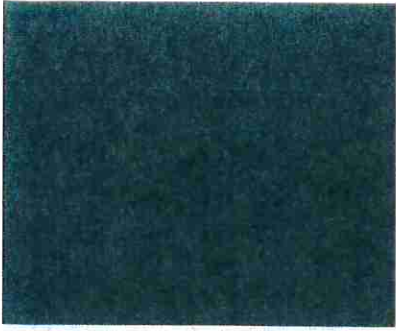
- **Primary Uses:**
  - Truck stops and service stations
  - Sit-down and drive-through restaurants
- **Secondary Uses:**
  - General commercial services
  - Auto dealerships
  - Farm/machinery implements
- **Recommended Density**
  - Maximum FAR: 0.25
- **Required Infrastructure**
  - Access to gravity sewer
  - Access to I-44 or future US 63 Bypass
  - A traffic study will be required to determine access improvements such as turn lanes, intersection controls, etc.



Big Box Examples



Highway Commercial Example



Retail Example



Entertainment Examples

## Retail

Retail uses comprise approximately 57 acres accounting for seven percent of the plan area. These areas are intended to accommodate a wide-range of small-scale commercial and office development. Uses may include commercial retail, professional office and services.

- **Primary Uses:**
  - Convenience retail uses such as coffee shops, movie rentals, banks, drug stores, service stations, specialty shops, etc.
  - Personal services including barber, hair salon, dry cleaners, photo studios, etc.
  - Sit-down restaurants
- **Secondary Uses:**
  - Small-scale professional and office services
- **Recommended Density**
  - Maximum Floor to Area Ratio: 0.20
  - Individual uses should be between 5,000 and 50,000 square feet
- **Required Infrastructure**
  - Access to gravity sewer
  - Access to an improved arterial or collector road
  - A traffic study will be required to determine access improvements
  - Minimum 4-foot pedestrian path with landscape buffer and pedestrian lighting from parking areas to buildings

## Entertainment

Entertainment uses comprise approximately 25 acres accounting for three percent of the plan area. These areas provide an opportunity for entertainment-oriented uses that are currently undeserved within Rolla and the surrounding region.

- **Primary Uses:**
  - Museum, theater, skating rink, bowling alley, etc.
- **Secondary Uses:**
  - Sit-down restaurants
  - Clubs, bars, etc.
  - Specialty retail
- **Recommended Density**
  - Maximum Floor to Area Ratio: 0.20
  - Individual uses should be between 5,000 and 25,000 square feet
- **Amenities**
  - District-themed site furniture
  - Development connected to greenway and trail network
- **Required Infrastructure**
  - Access to gravity sewer
  - Access to an improved arterial road
  - Minimum 4-foot pedestrian path with landscape buffer and pedestrian lighting from parking areas to buildings
  - Minimum 8-foot pedestrian connection from the development to the nearest sidewalk/trail

## Hospitality

Hospitality uses comprise approximately 31 acres accounting for four percent of the plan area (excluding open space, right-of-way, etc). These areas have excellent visibility to I-44 providing excellent opportunities for lodging, associated retail and service uses.

- **Primary Uses:**
  - Lodging including hotels, motels, etc.
  - Conference centers
- **Secondary Uses:**
  - Complimentary retail uses such as copy center, office supply, etc.
  - Sit-down and drive-thorough restaurants
  - Service stations
- **Recommended Density**
  - No maximum density for hotels or motels
  - Maximum Floor to Area Ratio: 0.25 for other retail and office uses
- **Required Infrastructure**
  - Access to gravity sewer
  - Access to an improved arterial
  - Minimum 4-foot pedestrian path with landscape buffer and pedestrian lighting from parking areas to buildings
  - Minimum 8-foot pedestrian connection from the development to the nearest sidewalk/trail

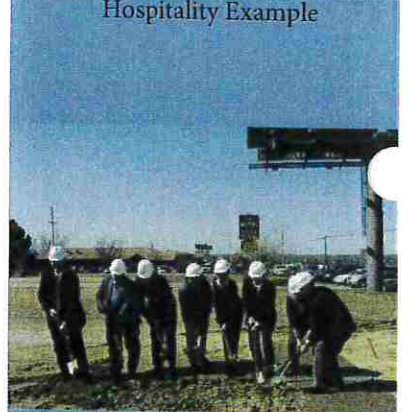
## Medical Campus

Medical campus uses comprise approximately 16 acres accounting for approximately two percent of the plan area (excluding open space, right-of-way, etc). This area will accommodate future St. Johns Clinic expansion and other medium-to-large scale medical-related office and ancillary uses in a “campus” setting.

- **Primary Uses:**
  - Medical clinics
- **Secondary Uses:**
  - Medical-related offices, services and retail including but not limited to drug stores, medical supplies, etc.
- **Amenities**
  - Access to park and open space areas
  - Development connected to greenway and trail network
- **Recommended Density**
  - No maximum density
- **Required Infrastructure**
  - Minimum 4-foot pedestrian path with landscape buffer and pedestrian lighting from parking areas to buildings
  - Minimum 8-foot pedestrian connection from the development to the nearest sidewalk/trail



Hospitality Example



St. Johns Clinic Ground-breaking

## Medical Office

Medical office uses comprise approximately 10 acres accounting for one percent of the plan area (excluding open space, right-of-way, etc). These areas will accommodate small-to-medium scale medical-related office and clinics.

- **Primary Uses:**
  - Small-scale medical-related offices and clinics
- **Secondary Uses:**
  - Medical-related retail including but not limited to drug stores, medical supplies, etc.
- **Recommended Density**
  - Maximum Floor to Area Ratio: 0.25 (Excludes the existing Bond Clinic)
  - Individual uses should be between 5,000 and 35,000 square feet
- **Required Infrastructure**
  - Minimum 4-foot pedestrian path with landscape buffer and pedestrian lighting from parking areas to buildings
  - Minimum 8-foot pedestrian connection from the development to the nearest sidewalk/trail



Medical Office Example



Office Campus Examples

## Office Campus

Office campus uses comprise approximately 28 acres accounting for three percent of the plan area (excluding open space, right-of-way, etc). These areas will accommodate medium-to-large scale offices located in a “campus” or “park-like” setting.

- **Primary Uses:**
  - Medium-to-large scale office
- **Secondary Uses:**
  - Complimentary retail and services including but not limited to office supply, copy center, convenience retail, sit-down restaurants, etc.
- **Recommended Density**
  - Maximum Floor to Area Ratio: 0.50
- **Amenities**
  - Enhanced pedestrian connection to Blues Lake
- **Required Infrastructure**
  - Minimum 4-foot pedestrian path with landscape buffer and pedestrian lighting from parking areas to buildings
  - Minimum 8-foot pedestrian connection from the development to the nearest sidewalk/trail

## Lifestyle Center

Lifestyle center uses comprise approximately 34 acres accounting for four percent of the plan area (excluding open space, right-of-way, etc). The lifestyle center is a concept that combines the traditional retail functions of a shopping center with the boutique retail and specialty services not found typical commercial centers. Additionally, unlike typical shopping centers, lifestyle centers tend to be smaller with greater architectural detail and amenities such as plazas, parks and trails.

- **Primary Uses:**
  - Specialty or boutique retail
  - Professional services
  - Upscale sit-down restaurants
- **Secondary Uses:**
  - Mixed-density residential (see next page for definition) as part of a larger Planned Unit Development (PUD) that includes some of the identified primary uses
- **Recommended Density**
  - Maximum Floor to Area Ratio: 0.25
  - Individual uses should be between 5,000 and 25,000 square feet
- **Amenities**
  - Wide (10-foot or greater) sidewalks
  - Upscale themed street furniture
  - Quality architectural details
- **Required Infrastructure**
  - Access to gravity sewer
  - Access to an improved arterial road
  - A traffic study will be required to determine access improvements.
  - Minimum 4-foot pedestrian path with landscape buffer and pedestrian lighting from parking areas to buildings
  - Minimum 8-foot pedestrian connection from the development to the nearest sidewalk/trail

## Mixed-Density Residential

Mixed-density residential uses comprise approximately 50 acres accounting for six percent of the plan area (excluding open space, right-of-way, etc). Allows a mix of detached and attached residential development with a wide variety of densities and housing types.

- **Primary Uses:**
  - Detached single-family residences
  - Attached residences including but not limited to town homes, duplexes, triplexes, fourplexes, etc.
- **Secondary Uses:**
  - Permitted accessory structures including ancillary units (also known as “granny flats” or garage apartments)
  - Complimentary neighborhood-scale retail uses as part of a PUD.
  - Institutional uses including schools, parks, libraries, churches, etc.
- **Recommended Density**
  - 6 to 12 dwelling units per acre.
- **Required Infrastructure**
  - Access to gravity sewer
  - Paved internal roads with curb, gutter and a minimum 4-foot sidewalk on both sides of the road



Lifestyle Center Examples



Mixed-Density Example



Multi-Family Example



Single-Family Example



Missouri S&T Mine

## Multi-Family Residential

Multi-family residential uses comprise approximately 43 acres accounting for five percent of the plan area (excluding open space, right-of-way, etc). These uses are intended to provide for future housing needs through the construction of a wide variety of attached residential development.

- **Primary Uses:**
  - Apartment buildings
- **Secondary Uses:**
  - Complimentary neighborhood-scale retail uses as part of a PUD.
  - Institutional uses including schools, parks, libraries, churches, etc.
- **Recommended Density**
  - 4 to 20 dwelling units per acre.
- **Required Infrastructure**
  - Access to gravity sewer
  - Access to an improved arterial or collector road
  - Minimum 4-foot pedestrian path with landscape buffer and pedestrian lighting from parking areas to buildings

## Single-Family Residential

Single-family residential uses comprise approximately 12 acres accounting for one percent of the plan area (excluding open space, right-of-way, etc). However, single-family uses are identified on the periphery of the plan area as a transition between rural uses in the County.

- **Allowed Uses:**
  - Single-family detached residences
- **Secondary Uses:**
  - Permitted accessory structures
- **Recommended Density**
  - 3 to 5 dwelling units per acre
- **Required Infrastructure**
  - Access to gravity sewer
  - Paved internal roads with curb, gutter and a minimum 4-foot sidewalk on at least one side of the road

## Mine Tours

The mine tour area is approximately 21 acres accounting for two percent of the plan area (excluding open space, right-of-way, etc). This experimental mine is currently owned and operated by Missouri S&T as a teaching resource use by faculty, students and approved visitors to demonstrate mining technology including safety and rescue techniques. At some point in the future, upon the University's approval and discretion, this area has the opportunity to be open to the public as an attraction.

- **Primary Uses:**
  - Mining and mineral extraction
  - University-related classrooms and offices
- **Secondary Uses:**
  - Visitors center
- **Required Infrastructure**
  - Controlled or grade-separated connection across the BNSF rail line
  - Paved internal roads with curb, gutter and a minimum 4-foot sidewalk on at least one side of the road

## Golf Course/Future Development

Golf course/future development uses comprise approximately 164 acres accounting for 20 percent of the plan area (excluding open space, right-of-way, etc). This is a transitional area in the southeast portion of the plan area that lacks a connected street network and a grade-separated or controlled access across the BNSF rail line. This area will likely remain rural within the short-term, however, future opportunities exist for a golf course and/or single-family neighborhoods.

- **Allowed Uses:**
  - Golf course
  - Single-family residential on larger lots
- **Recommended Density**
  - 1 to 2 dwelling units per acre
- **Required Infrastructure**
  - Access to gravity sewer
  - Controlled or grade-separated connection across the BNSF rail line and/or an improved connection to an existing east-west collector.

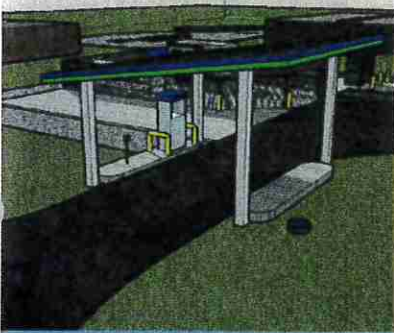
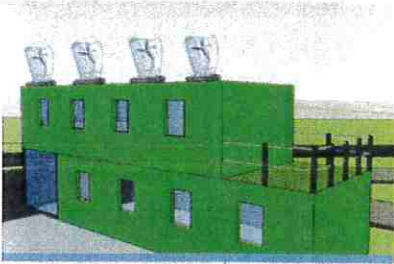


Golf Course Example



## E<sup>3</sup> Campus Development

The E<sup>3</sup> “E-Cubed” Campus Development is aimed at promoting and demonstrating eco-friendly technologies. Missouri S&T is creating an Energy, Environment, and Education (E<sup>3</sup>) Campus Development to demonstrate the ground breaking energy and environmental research underway at the university, while providing hands-on education opportunities for students. The E<sup>3</sup> Campus area is on university-owned property on the west side of the Route E and I-44 interchange. This campus has excellent visibility from I-44. Major anchor projects include an on-site hydrogen generation/storage/dispensing station for hydrogen fueled and plug-in hybrid electric vehicles, and a wind turbine to supply energy to the Missouri State Highway Patrol Troop I Headquarters. The E<sup>3</sup> Campus Development is intended to compliment offices planned at the University Technology Park. A conceptual master plan for the E<sup>3</sup> Campus Development is illustrated on page 30. Descriptions of the major uses are described below.



Proposed Transit Building and Hydrogen Refueling Station



Solar Homes under construction

### E<sup>3</sup> Alternative Energy Education and Student Design Center

This center will combine a world-class Student Design Center (where nearly 500 Missouri S&T students engage in nationally competitive, hands-on projects in areas related to energy efficiency and environmental sustainability) with an alternative energy education center designed to educate the general public through hands-on energy and environmental displays. Complimentary uses within this area may include a boutique hotel and ancillary campus-related retail.

### Hydrogen (H<sub>2</sub>) Project Area

The Hydrogen (H<sub>2</sub>) Project area includes the hydrogen fueling station which is one component of a research project which will help develop hydrogen fuel technology, while also addressing issues surrounding a transition to hydrogen. These issues include public perception, permitting, safety standards, education and training, infrastructure development and community communications. The H<sub>2</sub> Project Area will also include a renewable power park (solar photovoltaics/wind/hydrogen fuel cell), EcoCAR garage and a LEED (Leadership in Energy and Environmental Design) Certified Transit Depot building made from used shipping containers.

### Solar Village

This area will serve as a demonstration area for solar homes built by Missouri S&T students participating in the Department of Energy Solar Decathlon Competition. Three existing solar homes will be relocated to the Solar Village, while all future Solar Decathlon Competition homes will be constructed on-site in the village. Students who have participated in the construction of the solar homes can compete for the chance to live in the Solar Village. Because the village is on campus, this counts as Campus Approved Housing for Freshman and Sophomore students who are required to live on campus.

## Green Student Housing

This is an area with existing student housing made up of fraternities, and student apartments. In the future, as these buildings are renovated and/or replaced, opportunities to incorporate green building principles and alternative energy sources will be encouraged.

## Green Hotel and Convention Center

This is envisioned to be a “green” hotel and convention center which will provide opportunities to demonstrate green building techniques while attracting eco-friendly meetings and conventions. This hotel will also serve as a signature building and primary gateway to the E<sup>3</sup> Campus.

## Retail

This retail area will serve the E<sup>3</sup> Campus Development area and surrounding neighborhoods. Retail uses should incorporate green building techniques and should be campus oriented. Preferred uses include convenience retail, small grocery store, service station, book store, coffee shop, restaurant, etc.

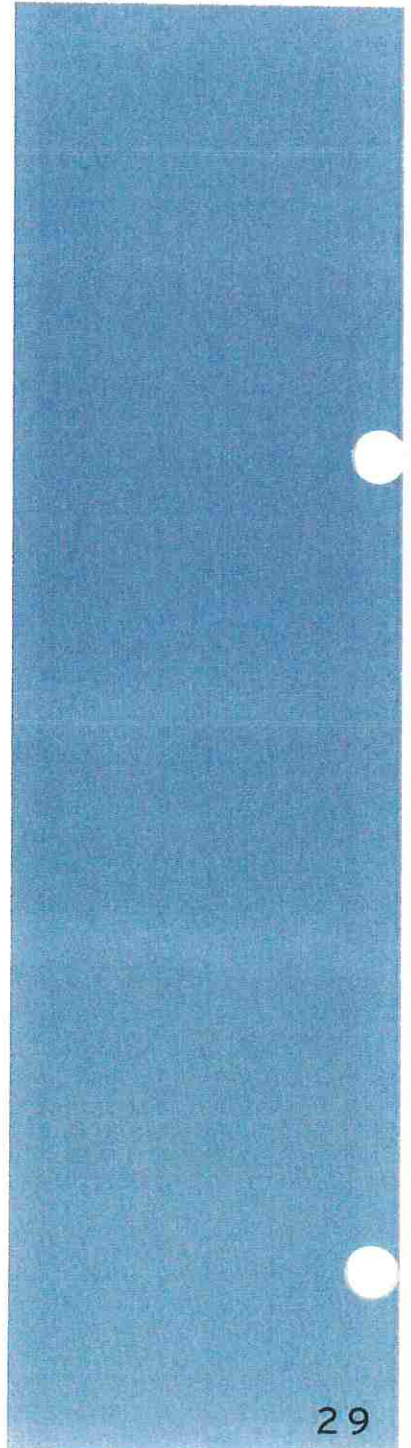
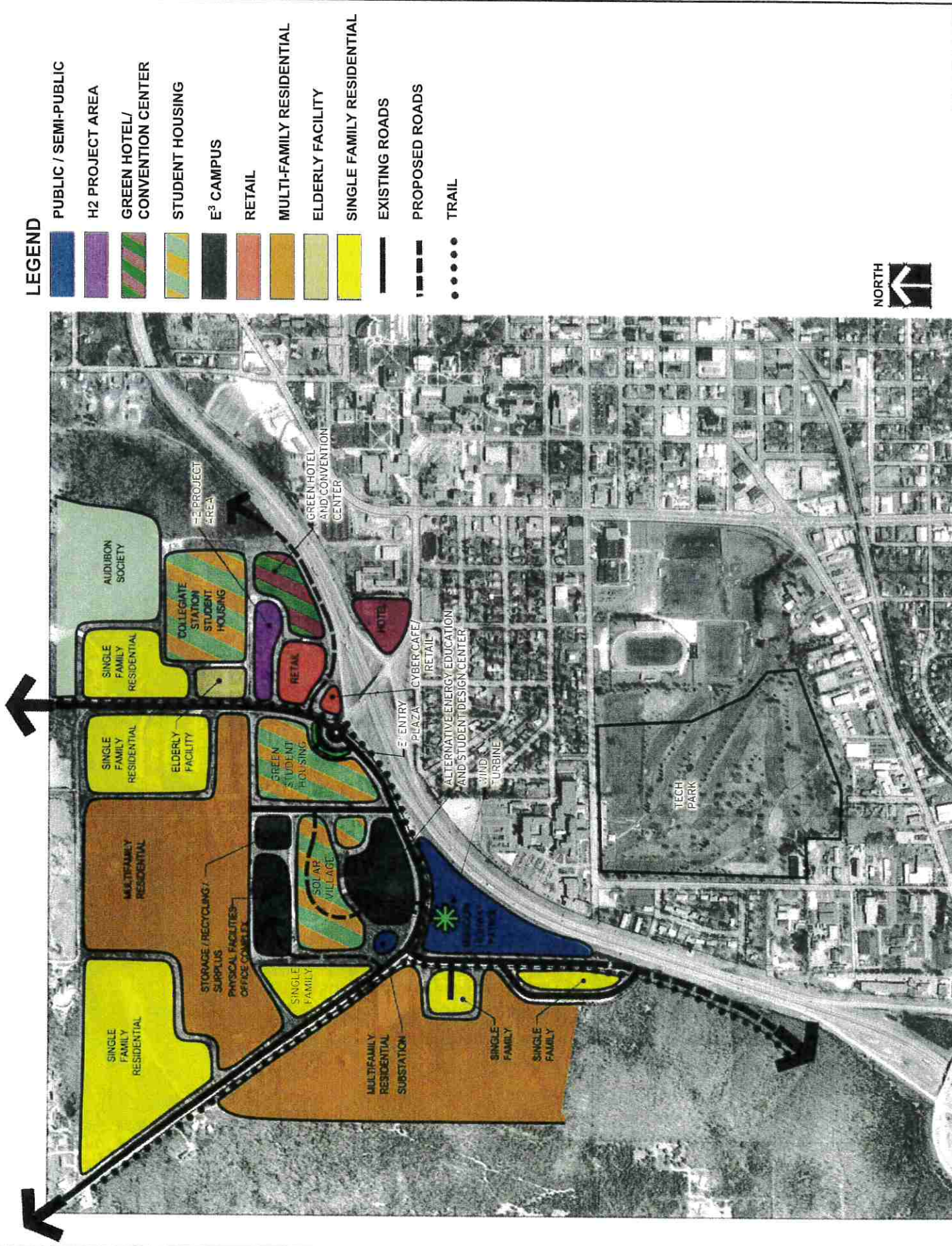


Exhibit 10: Land Use Plan (E<sup>3</sup> Campus Inset)



# Transportation

## Transportation Recommendations - West Side

The transportation recommendations balance the need for a safe and efficient transportation system with the desire to utilize public improvements to support development opportunities. Improvements to the existing transportation system are described in the text below and illustrated in Exhibit 11. Associated conceptual cost estimates are summarized in Table 1. A more detailed breakdown of the conceptual cost estimates, including key assumptions, is included in the Appendix at the end of this document. Currently, there is no funding identified in the Rolla Capital Improvements Program (CIP) for major transportation improvements identified within this Plan. As a general rule, new development within the plan area must “pay for itself” and not rely on the general city funds. Potential funding sources, such as a Community Improvement District, have been identified in the Implementation Section of this document.

### **Interstate and Highway Access and Improvements**

Quality interstate and highway access is critical to the long-term viability of Rolla maintaining and enhancing its status as the economic and cultural center of South Central Missouri. This is especially true for Rolla West, which will have two interchanges within the plan area along I-44 (an existing interchange at Kingshighway and a planned future fifth interchange in the western portion of the Plan Area). Despite excellent interstate access, participants noted that Rolla West needs improved access to I-44 and US 63.

### **Improvements to the Kingshighway Interchange**

The Kingshighway interchange provides access to I-44 from Kingshighway (Business 44). Kingshighway connects the frontage roads Old Wire Road to the north and Martin Springs Drive and Bridge School Road to the south. Based upon improvements to the future plan area road network identified during the Community Visioning Workshop (and described within this section) as well as potential improvements associated with I-44, the I-44 and Kingshighway interchange will need to be improved in the future when warranted or when necessitated by other proposed road improvements. Previous studies of the Highway 72 extension estimated that the interchange would warrant improvements within the next 10 years. The I-44 and Kingshighway Interchange will be an important catalyst to the development of the Plan Area west of I-44. The preferred concept identified at the Community Visioning Workshop is to extend Kingshighway (which currently ties into Old Wire Road) north and west to serve future development in the north portion of the Plan Area. Improvements would also be needed on the south side as Martin Springs Drive and Bridge School Road are upgraded. One concept identified during the Community Visioning Workshop is to tie the arterial frontage road connections into I-44 through a series of roundabouts at the ramp terminals. Further study and coordination with MoDOT is needed to determine the extent of actual improvements to this interchange.

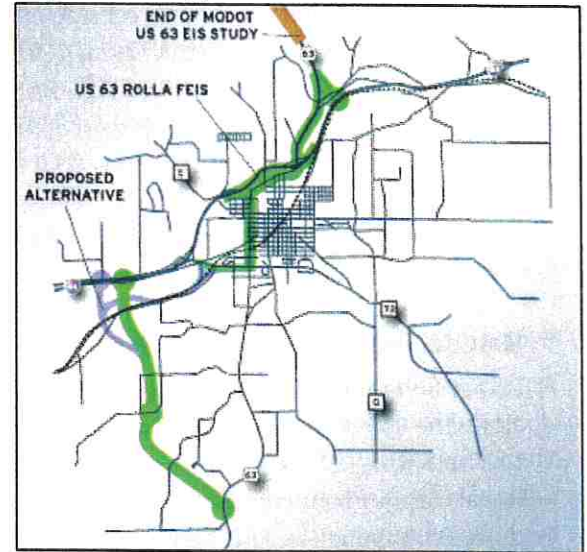
## Future Fifth I-44 Interchange

The future fifth I-44 interchange will serve a key catalyst for the ultimate development of Rolla West. Additionally, the fifth interchange will provide the ability to serve a future US 63 Bypass to the south, significantly reducing congestion along existing US 63 through Rolla. The US 63 Bypass must be built in concert with the fifth interchange. It should also be noted that MoDOT is currently studying a major reconstruction of I-44 through lanes. One alternative being considered is truck only lanes. This would have an impact on the type of interchange that is constructed.

## US 63 Bypass

US 63 is a major north-south route that connects Jefferson City and I-70 to the north and Arkansas to the south. Currently, US 63 is four-lane north of Jefferson City, two-lane between Jefferson City and Rolla, and two-lane south of Rolla. MoDOT is currently studying the potential to widen this section of US 63 to four-lanes between Jefferson City and Rolla. Due to land acquisition costs and potential impacts to existing businesses through Rolla, MoDOT is considering several options for US 63 through Rolla including a potential US 63

Proposed US 63 Bypass Alternative



bypass. To date, the preferred option is for the bypass to use I-44 and the new fifth interchange through a new alignment in the western portion of Plan Area that would connect back to existing US 63 south of Rolla.

## Highway 72/Ridgeview Extension

Today, a majority of local Rolla traffic will access Rolla West using Kingshighway. However, the Kingshighway and US 63 currently experiences undesirable congestion and safety levels. In addition, the 3-lane Kingshighway corridor from US 63 to I-44 experiences high traffic demand and slow moving traffic with difficulty for motorists to access the highway. This congestion along Kingshighway is a major issue for east-west traffic through the area.

An improvement to address this issue was identified in the *US 63 Bypass Environmental Impact Statement (EIS) Record of Decision* and was part of the Preferred Strategy adopted by MoDOT in 2002. The improvement was a new 4-lane roadway that would connect US 63 and State Route 72 on the east with I-44 on the west. The preferred option developed during the Community Visioning Workshop is to extend Highway 72/Ridgeview Road from US 63 southwest to connect to Bridge School Road. This would provide a more indirect route to I-44, however, it would improve traffic flow to Rolla West with less disruption to Kingshighway businesses. This improvement would provide congestion relief along Kingshighway and provide better ease of flow to Rolla West. A majority of participants commented at this Workshop that the Highway 72 Extension was as important to the future success of Rolla West as the construction of the fifth interchange. Further study is needed to determine an alignment and detailed costs and impacts associated with this new alignment.

## **Arterial Roads**

Arterial roads will carry the bulk of traffic through the Plan Area. Existing and planned arterial roads within the plan area include Bridge School Road, Blues Parkway, Martin Springs Drive, Old Wire Road, Kingshighway Extension, Sally Road and Gaddy Road. New construction and/or major improvements to each of these roads is described on the following pages.

### **Martin Springs Drive and Extension**

Martin Springs Drive is the south 2-lane frontage road along I-44 that currently connects the Kingshighway interchange on the east side of the Plan Area to the proposed future fifth interchange on the west side of the Plan Area and a future US 63 bypass south of the interchange. Martin Springs Drive currently runs west of the Rolla Airport and curves south connecting to a future Bridge School Road extension. The proposed Martin Springs Extension will run west of Blue's Lake and curve south of the proposed fifth interchange connecting to a new US 63 bypass alignment providing access to the new interchange. Existing Martin Springs Drive and the new extension will be 3-lanes with a 5-foot sidewalk. Because Martin Springs Drive is within MoDOT right-of-way, the City will need to coordinate all improvements with MoDOT.

### **Bridge School Road and Extension**

Bridge School Road is currently a 2-lane road that extends from Kingshighway west along the south edge of the Plan Area and eventually curves north connecting into Martin Springs Drive. The proposed Bridge School Extension will curve north of the Royal Canin Plant, connecting into the proposed US 63 Bypass providing access to the new interchange, and curving northwest connecting into Martin Springs Drive. Bridge School Road and extension will be 3-lanes with a 5-foot sidewalk.

### **Blues Lake Parkway**

Blues Lake Parkway, located just east of Blues Lake is currently a 2-lane road that connects Martin Springs Drive to Bridge School Road. Blues Lake Road was recently completed and is not proposed to be improved in the future.

### **Old Wire Road**

Old Wire Road is currently a 2-lane frontage road along the north side of I-44 that currently connects the Kingshighway interchange on the east side of the Plan Area to the proposed fifth interchange on the west side of the Plan Area. Old Wire Road currently runs west of the proposed interchange connecting into County Road 8160 to the west of the Plan Area. Old Wire Road will remain on its current alignment but will be improved to 3-lanes with a 5-foot sidewalk. Because Old Wire Road is within MoDOT right-of-way, the City will need to coordinate all improvements with MoDOT.

### **Kingshighway Extension**

Currently, the Kingshighway interchange ties into Old Wire Road to the north of I-44. The Kingshighway Extension is a new road that will provide access to future developments in the northern portion of the Plan Area and will connect the existing Kingshighway interchange to an improved Gaddy Road which will provide access to the future fifth interchange. The new road extension will be designed and right-of-way acquired for 5-lanes with a 5-foot sidewalk. However, initially, a 3-lane section is likely to be build as an initial phase construction.



### **Vista Drive**

Vista Drive is currently a 2-lane road that connects to Highway E in the southwestern portion of the E<sup>3</sup> Campus area and dead ends to the south. This road is proposed to be improved and extended to southwest to connect to the future Kingshighway Extension in Rolla West.

### **Gaddy Road**

Gaddy Road (also known as County Road 8130) is currently a 2-lane county road. This road is proposed to be improved to 3-lanes with new curb and gutter. Near the future interchange area, Gaddy Road will be 4-lanes. However, right-of way will be acquired for all as development occurs for construction of 5-lanes as part of a long-term US-63 Bypass connection to the north.

### **Collector Roads**

These roads “collect” and distribute traffic from developments and neighborhoods to arterial roads and are the responsibility of adjacent developers. It is recommended that a system of collectors be built to provide connections from local neighborhoods to arterials or highways.

### **Local Roads**

Local roads provide access within neighborhoods and are the responsibility of the developer. It is recommended that the future local roads be designed to connect to existing and planned neighborhoods. Interconnectivity between adjacent neighborhoods and developments can help alleviate traffic congestion on arterials and collectors as well as provide improved level of service for emergency vehicles. Cul-de-sacs and closed subdivisions with a single point of entry/egress are discouraged.

### **Trail/Greenway**

As shown in the Future Land Use Map and Future Road Network Map, a series of trails/greenways are recommended along creeks and low-lying areas to provide pedestrian connections throughout the Plan Area. Hiking and biking trails are also proposed to be constructed within the right of way of the future Kingshighway Extension and Gaddy Road. These trails will provide opportunities for future pedestrian connections as the West Rolla Development matures. Throughout the public workshop process the creation of future pedestrian trails and greenways was given a high priority by the public and stakeholders.

Exhibit 11: Future Road Network



LEGEND

- PROPOSED HIGHWAY
- PROPOSED ARTERIAL
- EXISTING \ IMPROVED ARTERIAL
- PROPOSED COLLECTOR
- EXISTING \ IMPROVED COLLECTOR
- GREENWAY
- THESE AREAS WILL REQUIRE FURTHER STUDY IN THE FUTURE
- TRAIL



## Summary of Conceptual Cost Estimates - West Side

The table below summarizes conceptual cost estimates for the proposed transportation improvements. A more detailed breakdown of these conceptual costs are included in the Appendix at the end of this document.

**Table 1: Summary of Conceptual Road Improvement Costs**

Roadway Descriptions	Roadway Total
Bridge School Road (Improved to 3 lane )	\$4,845,000.00
Kingshighway/Extension (4 lanes on the new ROW extension)	\$6,682,200.00
Martin Springs Drive (Improved to 3 lane )	\$4,276,200.00
Old Wire Cutter Road (Improved to 3 lane )	\$4,362,200.00
Sally Road (Improved to 3 lane w/ new culverts)	\$1,722,600.00
Gaddy Road (Build to 3 lanes plan for 5 lane ROW w/ new culvert)	\$4,478,900.00
Vista Drive Improvement/Extension (2-lane road w/new cluvert)	\$2,093,621.00
<b>Subtotal Roadway Network Costs</b>	<b>\$26,367,100.00</b>
<b>Proposed 5th interchange</b>	
5th Interchange (I-44 and Gaddy Road) low estimate	\$15,000,000.00
5th Interchange (I-44 and Gaddy Road) high estimate	\$20,000,000.00
<b>Total Costs (low estimate)</b>	<b>\$41,367,100.00</b>
<b>Total Costs (high estimate)</b>	<b>\$46,367,100.00</b>

(\*) Unit costs include 20% contingency; design & construction administration; and assume asphalt pavement cost is \$75 per ton installed.

## Transportation Recommendations - East Side



A workshop was held on October 1, 2008 with city staff to discuss transportation on the east side of the Rolla West study area. This area is currently undergoing changes in land use and transportation. Specifically, Missouri University S&T is redeveloping their existing golf course into a technology research park, Ridgeview Drive is planned to be extended from Highway 72 and US 63 west to connect with Kingshighway and aesthetic and capacity improvements to Kingshighway are being discussed as Kingshighway is one of the key gateways into the community. The following provides a summary of the focus areas:

- Missouri University S&T Research Park
- Ridgeview Extension
- Kingshighway Improvements

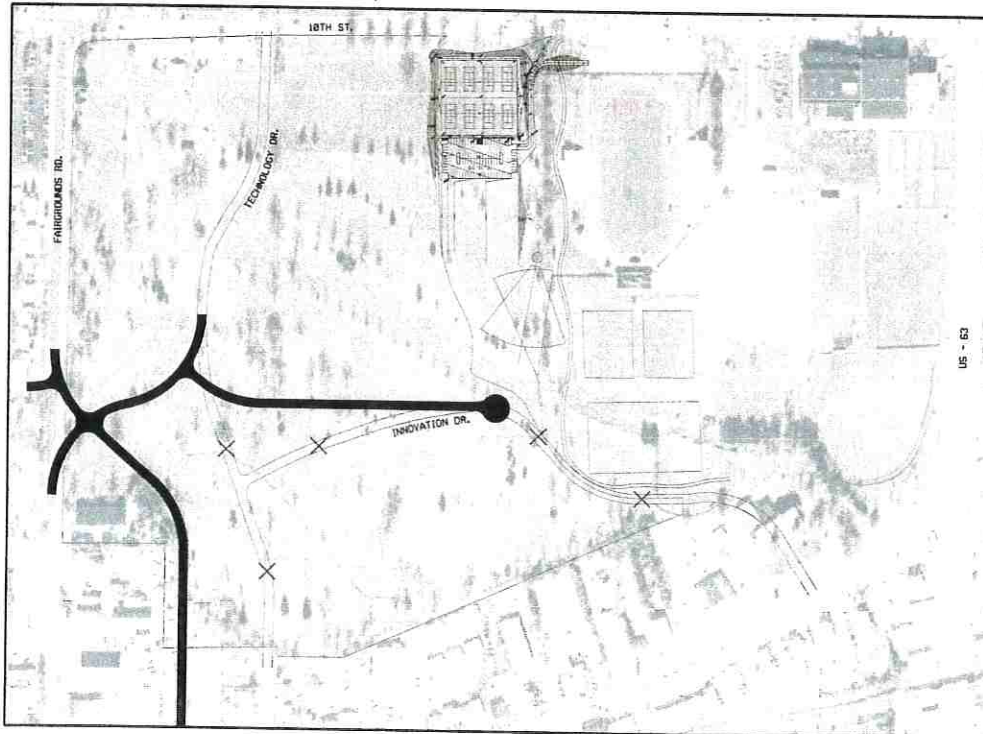
The complete Transportation Study Report is located in Appendix B on Page 52.

### Missouri S&T Research Park

Missouri University S&T is planning to redevelop the existing golf course located north of Kingshighway, south of 10th Street, east of Fairgrounds Road and west of US 63. The site is planned to be a university technology research park with office and labs occupying the area. The proposed site plan is shown in Figure 1. The transportation system was analyzed in regards to the impact to the peripheral street system.

Based on the traffic analysis of the Research Park, recommendations to preserve the safety and traffic operations of Kingshighway, the study team identified an alternative research park roadway network. The alternative roadway network is shown. The alternative roadway network relocates Technology Drive west to better align with a connection with the planned Ridgeview extension at Bryant Drive, south of Kingshighway.

Innovation Park Internal Roadway Network Alternative



## Ridgeview Extension

The Ridgeview extension is planned to extend from the intersection of US 63 and Highway 72 west. The purpose of this road is to provide improved east-west mobility in Rolla. However, the connection to the west has been unknown up to this point. The US 63 Bypass EIS identified the Ridgeview extension as a bypass to Kingshighway and US 63 providing access for US 63 traffic from the south and US 72 traffic from the east with a limited access road that would provide quick access to I-44 from US 63 and Highway 72.

Through the Rolla West master planning process, the community identified the desire for the Ridgeview extension to provide access to the new Rolla West study area. As a result, there is a desire for the Ridgeview extension to connect to both Kingshighway and Bridge School Road on the west-side. Physical constraints of the BNSF railroad and existing businesses located on the south side of Kingshighway have made connections to both Kingshighway and Bridge School Road difficult.

Building on the work of the community during the Rolla West master planning workshops, an alternative alignment for Ridgeview that crosses the railroad and connects to Bryant Drive for a connection to Kingshighway and Bridge School Road for a connection to Rolla West was developed.

As shown, the proposed Ridgeview extension which connects US 63 and US 72 to both Kingshighway and Bridge School Road.

Ridgeview Extension



There is a need to improve transportation for all modes (vehicular, pedestrian, bicycle) throughout the Kingshighway corridor. A comprehensive approach to this problem is referred to as Complete Streets. Complete Streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and bus riders of all ages and abilities are able to safely move along and across a complete street

The existing roadway has a 70-foot ROW through the study area with traffic lanes that consist of one travel lane each way with a center turn lane. The travel lanes are approximately 15-feet wide each, with the center turn lane being 15-feet wide. The total pavement width for the existing roadway is 45-feet back of curb to back of curb.

Two concepts for the future widening and enhancement of the Kingshighway corridor were developed which include a 5-lane section with a center turn lane and a 5-lane section with a raised median. The common goals of these two concepts are:

- Removal of excessive curb cuts to help the traffic flow / access management issues and improve the overall aesthetics of the roadway by creating more opportunities for landscape and turf areas.
- Consistent street tree plantings throughout the corridor to create a continuity of visual elements.
- Reduction of visual clutter through the implementation of a future signage ordinance, with requirements for consistent materials and size restrictions to promote unifying design elements.
- Potential to relocate overhead utilities underground to reduce visual clutter.
- Propose an ornamental light standard that is consistent throughout the corridor adding the opportunity for seasonal and festival banners.
- Improve the pedestrian environment through way finding signage.
- Consistent pedestrian bench and site furnishings throughout the corridor.

Existing Kingshighway Looking Northeast



4-Lane Divided/Center Turn Lane Enhancement of Kingshighway Looking Northeast



# Implementation

## **Implementation Tasks**

Implementation of the Rolla West Master Plan is dependent upon the following three critical tasks:

- Plan adoption by the City of Rolla;
- Implementation of a successful annexation strategy; and
- Financing Mechanisms

## **Plan Adoption and Use**

Upon adoption by the Rolla City Council and Planning Commission, the Master Plan will serve as the official long-term guide for the Rolla West area. As such, the Master Plan will be consulted by public officials including the City Council, the Planning Commission and City staff when considering development proposals, updating land use regulations, outlining work programs, preparing annual budgets, and reviewing progress toward meeting identified goals. The Master Plan will also be used to guide residents, land owners, project applicants and other parties concerning land planning and community development objectives within this area.

The Plan should be consulted by City staff, the Planning Commission and the City Council when considering development proposals and updating land use regulations within the Rolla West area. The Plan should be used as a resource for residents, land-owners and project applicants concerning land planning and community development objectives. Additionally, City staff and public officials should use this document to guide future Capital Improvement Plan (CIP) considerations in the area. The Plan should be reviewed annually and revised as specific actions are achieved and new strategies are identified. The Plan recommendations should be reviewed periodically when new circumstances or changing conditions warrant reconsideration.

## **Annexation Strategy**

Annexation is the process by which a city extends its municipal services, regulations, voting privileges and taxing authority to new territory. Because of the fiscal implications of annexation, the costs of providing municipal services should be estimated and weighed against the anticipated revenues of areas proposed for annexation. Performing a fiscal impact analysis does not mean that only areas with positive cash flow should be annexed. There will be instances when health, safety, environmental, or other factors will override fiscal considerations and an area may need to be annexed despite its fiscal impact. As a policy, future annexation proposals should benefit existing residents of the city. Ideally, annexation should occur concurrently with development. However, the City may consider annexing strategic areas to coordinate future roadway and infrastructure improvements and to maximize the future development potential of the area. Currently, the portions of the Plan Area fronting I-44 are within the City limits. However, the City may consider annexing the areas around the future fifth interchange and future US 63 Bypass. This should be completed as soon as a definitive footprint is identified for the interchange and centerline established for the US 63 Bypass.

## Financing Mechanisms

The City should ensure that current revenue rates are adequate and/or seek alternative revenue sources or financing mechanisms. Presented below are potential options for funding improvements within the West Rolla area. To develop fair, practical and efficient ways to increase revenues, it is recommended that attention be paid to the following characteristics of each: equity, economic development, adequacy, ease of administration and legal feasibility.

### Community Improvement District (CID)

Missouri Statutes, "Sections 67.1400 et seq., RSMo," authorize the creation of Community Improvement Districts (CID). The purpose of a CID is to raise money to provide improvements to a specific area. A CID may be established as either a political subdivision or as a not for profit corporation. If the CID is established as a political subdivision, it is governed by a board of directors that, as specified in the petition, is either elected by the qualified voters in the district or appointed by the City. If the CID is a not-for-profit corporation, the directors are selected in accordance with the provisions of Chapter 355 of the Missouri Statutes.

Missouri Statutes provide a CID with a variety of enumerated powers, including the authority to construct, reconstruct, install, repair, maintain, and equip public improvements including parks and streets. The improvements in a CID organized as a political subdivision or a not for profit corporation may be funded by the imposition of special assessments. If the CID is a political subdivision, the improvements may also be funded by a real property tax levied within the district after approval by a majority of the qualified voters within the district.

### Transportation Development District

Missouri Statutes, "Sections 238.207 et seq., RSMo," authorize the City to create Transportation Development Districts (TDDs). The statutorily-stated purpose of TDDs are to fund, promote, plan, design, construct, improve, maintain, and operate one or more transportation projects or to assist in such activity.

TDDs are created by submission of a petition to the circuit court from either 50 registered voters in each county in the district, by owners of real property in the district, or by the City Council. The petition must identify the district's boundaries, each proposed project, and a proposal for funding the projects. After receipt of a petition and a hearing to determine that the petition complies with the law, the circuit court enters a judgment certifying the questions regarding creation of the district, projects to be developed, and proposed funding for voter approval. If a simple majority of registered voters or property owners included in the district boundaries (depending on the type of petition submitted to request creation of the district) vote in favor, the TDDs are created. If the issue fails, it cannot be resubmitted to the voters again for two years. Once created, TDDs are considered a separate political subdivision of the state with powers such as condemnation, the power to contract with parties, to lease or purchase real or personal property and to sue and be sued.

### Tax Increment Financing District (TIF)

The basic concept behind TIF is that the redevelopment of the area approved as a redevelopment district will increase the equalized assessed valuation of the property, thereby generating new revenues to a city that can be used to pay for specified costs of a redevelopment project. These costs may include construction of public facilities within a redevelopment area. Property taxes and other revenues generated by the exist-

ing development in a legislatively defined redevelopment district are frozen when the redevelopment is approved by the City Council and the increased property tax and a portion of other revenues generated by the new development are captured and placed in a special fund to pay for the costs of redeveloping the area. Those new property tax revenues are the source of the term “increment,” and they are also referred to as “payments in lieu of taxes” (PILOTs).

In addition to the PILOTs, the development may also capture up to 50% of certain locally imposed taxes (commonly referred to as economic activity taxes or “EATS”) such as local sales, franchise taxes and utility taxes and local earnings taxes to fund project costs. Certain new state revenues (one-half of general state sales tax or one-half of state individual income tax withheld from new employees in the redevelopment area) generated by a redevelopment project may be captured under limited circumstances where the area is blighted and is located in either an enterprise zone, federal empowerment zone, or a central business district or urban core area with at least one 50 year old building and that suffers from 20 year pattern of declining population or property tax revenue. State statutes also authorize bonds to be issued that are paid from the PILOTs and EATS generated in the redevelopment area.

### **Impact Fees**

Impact fees can be defined as new growth’s fair share of the cost to provide necessary capital facilities. Impact fees have been used to address the costs of many different types of facilities, including water supply, wastewater treatment, roads, schools, open space and parks, government facilities, public safety and storm water management. While developers have traditionally provided project specific infrastructure improvements, impact fees address the costs of needed system improvements.

### **Excise Tax**

Similar to impact fees, excise taxes are often used to fund new infrastructure and services necessitated by new growth. This revenue mechanism has greater flexibility than impact fees because it is a tax, rather than a development exaction that must withstand a rational nexus and direct benefit test.

### **Special Assessment**

Special assessments are an old and widely used financing method where the cost of a facility such as a road improvement is allocated fully or partially against benefited property. Typical methods of assessment include the lot method, in which each lot (or equivalent) pays an equal share; the area method, in which costs are allocated in proportion to the area/front footage of each property; and based on assessed value.

### **Developer Exactions**

Exactions are developer funded, in-kind contributions of land, facilities, or services that are demanded as a condition of development approval. Negotiated agreements between the developer and the local jurisdiction traditionally include off-site infrastructure, such as roads, water and sewer lines and site contributions.

### **Special Taxing Districts**

A special taxing district, sometimes also known as a municipal service district (MSD), permits the additional taxation of property owners within certain geographic boundaries, to fund additional special services provided within the service district. Revenues raised by an MSD can be used to pay for both capital improvements and operating expenses. Depending on State law, the municipal service district may be managed by

the municipal government or by an autonomous governing body with the power to levy taxes and borrow funds. MSD's can be organized around a variety of different services and facilities, such as ambulance and police services, trash removal, sewage, management, beautification, and recreation.





# Appendix A

## Cost Estimates for Proposed Transportation Improvements - West Side

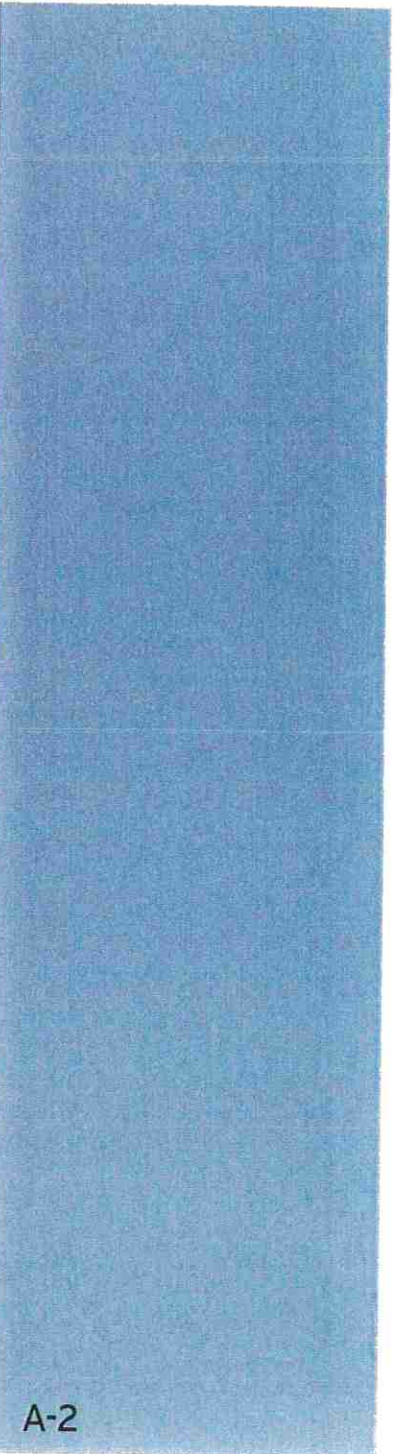
This opinion of probable construction cost is intended to provide preliminary, order of magnitude, costs to construct the proposed street extensions and improvements. Unit costs listed in the summary table are derived from individual cost opinions for each street. Individual opinions are divided into costs for new street extensions, and costs for widening and improvements, including widening existing or rebuilding existing streets. Major cost items such as large culverts and major utility relocations have been identified in the individual street cost opinions. The following assumptions apply to this opinion:

### **General Cost Estimate Assumptions:**

- Right-of-way acquisition for new streets and for widening existing streets is not included in these estimates.
- Milling unit price includes the cost of trucking and disposal of cuttings from site.
- “Widening of Existing Pavement” unit price based on \$12.00 for the aggregate base and \$21.00 for 5-inch bituminous pavement mixture.
- “Storm Sewer RCP” unit price based on 24-inch RCP.
- “Precast Drop Inlets” based on two per 300 linear feet of road.
- Includes street lighting (poles, conduit, wiring, etc.) as indicated. Does not include primary distribution system or transformers.
- Linear grading unit costs allow minor grading to flatten and straighten existing alignments and new streets. No mass excavation is included.
- Design and construction administration fees are included in each individual estimate.
- All streets except Kingshighway are 40-foot wide, back to back of curb, with a 24-inch concrete curb and gutter on either side. Pavement thickness is per City of Rolla Standard Plans.
- All streets include a 5-foot wide concrete walk on one side.
- Asphalt paving unit costs are based on expected future asphalt costs of \$75 per ton.
- Includes signalized intersections at: Future St. Johns Boulevard and Bridge School Road, Blues Lake Parkway and Bridge School Road, Gaddy Road Extension and Bridge School Road, Old Wire Road and Kingshighway Extension, Sally Road and Kingshighway Extension, Gaddy Road and Kingshighway Extension, Martin Springs Drive and Gaddy Road and Old Wire Road, and Gaddy Road and Martin Springs Drive, and Gaddy Road and Martin Springs Drive.
- Does not include the cost of utility extensions for water, sanitary sewer, electric, communications or natural gas into the project area.

### **Kings Highway Extension Cost Estimate Assumptions:**

- Does not include improvements to the Kingshighway overpass and off-ramps. Does not include traffic signals and intersection improvements for the intersections at Kingshighway and Martin Springs Drive; Kingshighway and Bridge School Road; Kingshighway and future Highway 72 extension; interstate ramps and Kingshighway and Fairgrounds Road.



### **Kings Highway Extension Cost Estimate Assumptions:**

- Assumes 52-feet wide, back to back of curb.
- Does not include mass excavation east of existing interchange. Future developer is expected to grade Kingshighway alignment with adjoining development.
- Includes construction of a new culvert east of Sally Road.

### **Bridge School Road Cost Estimate Assumptions:**

- “Relocate Existing Hydrants” based on assuming one hydrant per 300 linear feet of road.
- “Relocate Overhead Electric” based on 1,800 linear feet at \$28 per linear foot.
- “5-foot Concrete Sidewalk” is to be on one side of road and replace the existing sidewalk that will be removed during the widening of Bridge School Road.
- Does not include right-of-way acquisition or improvements to the intersection with Kingshighway.
- Includes new storm drainage system.
- Assumes a complete reconstruction of the existing street.

### **Martin Springs Drive Cost Estimate Assumptions:**

- There is an existing storm drainage system along the south side of the street (approximately 4,000 linear feet). Includes new storm drains on the north side of the street (approximately 5,800 linear feet) and along part of the south side (approximately 1,700 linear feet).
- Includes 19 “Precast Drop Inlets” on the north side and 6 inlets on the south side.
- Assumes widening existing street.

### **Old Wire Road Cost Estimate Assumptions:**

- Includes replacing existing drive entrances. Unit cost is \$10 per square foot.
- Includes new storm drainage system.
- Assumes widening existing street.

### **Sally Road Cost Estimate Assumptions:**

- “Utilities Relocate” based on relocating 2,700 linear feet of overhead electric at \$28 per linear feet.
- “Culvert Extension” quantities based on lengthening an existing 30-foot culvert an additional 30-feet.
- “Culvert Replacement” quantities based on replacing an existing culvert located approximately 0.3 mile north of the intersection of Sally Road and Old Wire Road.
- Assumes a complete reconstruction of the existing street.

### **Gaddy Road Cost Estimate Assumptions:**

- “Culvert Replacement” quantities based on replacing an existing culvert located approximately 100 feet north of the intersection of Gaddy Road and Old Wire Road.
- “5” Bituminous Base & 1 3/4” BP-1 Pavement” unit price based on \$21.00 for 5-inch bituminous pavement mixture and \$7.50 for 1 3/4-inch Pavement.
- Does not include cost of new ramps and overpass, nor signalized intersection for ramps.
- Includes signalized intersection for outer road connections.

**Table 1A: Conceptual Road Improvement Costs**

Proposed Rolla West Transportation Improvements Preliminary Opinion of Probable Costs									
Item	Roadway Description	New ROW Improvements		Unit	Qty.	Existing ROW Improvements		Roadway Total	
		Unit Price	Total			Unit Price	Total		
1	Bridge School Road (Improved to 3 lane )	LF	7,500	\$646.00	LF	0	\$0.00	\$0.00	\$4,845,000.00
2	Kingshighway / Extension (4 lanes on the new ROW extension) (No Mass Grading, Provided by Developer(s))	LF	8,600	\$777.00	LF	0	\$0.00	\$0.00	\$6,682,200.00
3	Martin Springs Drive (Improved to 3 lane )	LF	4,600	\$511.00	LF	5,800	\$332.00	\$1,925,600.00	\$4,276,200.00
4	Old Wire Road (Improved to 3 lane )	LF	5,800*	\$509.00	LF	3,000	\$470.00	\$1,410,000.00	\$4,362,200.00
5	Sally Road (Improved to 3 lane w/ new culverts)	LF	0	\$0.00	LF	2,700	\$638.00	\$1,722,600.00	\$1,722,600.00
6	Gaddy Road (Build to 3 lanes plan for 5 lane ROW w/ new culvert)	LF	3,800	\$720.00	LF	2,900	\$601.00	\$1,742,900.00	\$4,478,900.00
7	Vista Drive Improvement/Extension (2 lanes on the new ROW extension)	LF	4,340	\$482.40	LF	0	\$0.00	\$0.00	\$2,093,621.00
<b>SUBTOTAL ROADWAY NETWORK COSTS</b>							<b>\$21,659,621.00</b>	<b>\$6,801,000.00</b>	<b>\$28,460,721.00</b>
<b>Proposed 5th interchange</b>									
8	5th Interchange (I-44 and Gaddy Road) low estimate								\$15,000,000.00
	5th Interchange (I-44 and Gaddy Road) high estimate								\$20,000,000.00
<b>TOTAL COSTS (Low Estimate)</b>									<b>\$43,460,721.00</b>
<b>TOTAL COSTS (High Estimate)</b>									<b>\$48,460,721.00</b>

(\*) Unit costs include 20% contingency; design & construction administration; and assume asphalt pavement cost is \$75 per ton installed.

(\*\*) See assumptions outlined on cover sheet of this option.

(\*\*\*) All costs are based conceptual plan improvements in 2008 construction costs

**Table 2A: Bridge School Road Replacement  
Opinion of Probable Cost Breakdown**

Improvements include replacing approximately 5,500 lineal feet of existing roadway with a 40' commercial roadway with sidewalk on one side, and curb & gutter on both sides. Also, extending the road 2,000 lineal feet with a sidewalk on one side, and curb & gutter on both sides.

Item No.	Description	Qty	Unit	Unit Price	Total	
<b>Demolition</b>						
1	Demo of Existing Roadway	5,500	LF	\$15.00	\$82,500.00	
<b>Pavement</b>						
2	Linear Grading	2,000	LF	\$60.00	\$120,000.00	
3	Subgrade Preparation	24,500	SY	\$3.00	\$73,500.00	
4	Type 1 Aggregate Base (16" thick)	30,000	SY	\$12.00	\$360,000.00	
5	1 3/4" Surface Course Bituminous Pavement	30,000	SY	\$7.50	\$225,000.00	
6	5" of Bituminous Base Pavement	30,000	SY	\$21.00	\$630,000.00	
7	2' Concrete Curb & Gutter	15,000	LF	\$20.00	\$300,000.00	
<b>Drainage</b>						
8	Storm Sewer RCP	8,625	LF	\$60.00	\$517,500.00	
9	Precast Drop Inlets	51	EA	\$3,000.00	\$153,000.00	
<b>Utilities</b>						
10	Relocate Existing Hydrants	19	EA	\$2,500.00	\$47,500.00	
11	Relocate Overhead Electric	1	LS	\$50,400.00	\$50,400.00	
12	Standard Street Lighting	7,500	LF	\$40.00	\$300,000.00	
13	Signalized Intersection	3	EA	\$175,000.00	\$525,000.00	
<b>Miscellaneous</b>						
14	5' Concrete Sidewalk	7,500	LF	\$30.00	\$225,000.00	
15	Drive Entrances	11	EA	\$3,850.00	\$42,350.00	
16	Seed & Mulch	15,000	LF	\$2.00	\$30,000.00	
					SubTotal =	\$3,681,750
					Contingency (20%) =	\$736,350
					<b>Construction Subtotal =</b>	<b>\$4,418,100</b>
					Design Engineering (5.5%) =	\$242,996
					Bidding & Construction Engineering (75% of Design) =	\$182,247
					<b>Opinion of Probable Project Cost =</b>	<b>\$4,843,342</b>
General Note: Does not include right-of-way acquisition or improvements to the intersection with Kingshighway.						
					Roadway Length	7,500
					Cost Per Foot	\$646

**Table 3A: Kingshighway Extension  
Opinion of Probable Cost Breakdown**

Extend Kingshighway approximately 8,600 L.F. Roadway will be 52-ft back-of-curb to back-of-curb, with 2-ft wide curb & gutter. The roadway will have asphaltic cement pavement and all necessary storm water appurtenances.

Item No.	Description	Qty	Unit	Unit Price	Total	
<b>Pavement</b>						
1	Linear Grading and Subgrade Preparation	8,600	LF	\$80.00	\$688,000.00	
2	Type 1 Aggregate Base (16" Thick)	45,867	SY	\$12.00	\$550,404.00	
3	1 3/4" Surface Course Bituminous Pavement	45,867	SY	\$7.50	\$344,002.50	
4	5" of Bituminous Base Pavement	45,867	SY	\$21.00	\$963,207.00	
5	2' Concrete Curb & Gutter	17,200	LF	\$20.00	\$344,000.00	
<b>Drainage</b>						
6	24" Class III RCP	9,900	LF	\$50.00	\$495,000.00	
7	Precast Drop Inlets	58	EA	\$3,000.00	\$174,000.00	
8	Culvert Construction	240	LF	\$1,500.00	\$360,000.00	
<b>Utilities</b>						
9	Standard Street Lighting	8,600	LF	\$40.00	\$344,000.00	
10	Signalized Intersection	3	EA	\$175,000.00	\$525,000.00	
<b>Miscellaneous</b>						
11	5' Concrete Sidewalk	8,600	LF	\$30.00	\$258,000.00	
12	Seed & Mulch	17,200	LF	\$2.00	\$34,400.00	
					SubTotal =	\$5,080,014
					Contingency (20%) =	\$1,016,003
					<b>Construction Subtotal =</b>	<b>\$6,096,016</b>
					Design Engineering (5.5%) =	\$335,281
					Bidding & Construction Engineering (75% of Design) =	\$251,461
					<b>Opinion of Probable Project Cost =</b>	<b>\$6,682,758</b>
General Note: Does not include Right of Way acquisition or improvements to Kingshighway off ramps, overpass, or intersection with Bridge School Road.						
					Roadway Length (ft)	8,600
					Cost Per Foot	\$777

**Table 4A: Martin Springs Drive Extension  
Opinion of Probable Cost Breakdown**



Extend Martin Springs Drive approximately 4,600 L.F. Roadway will be 40-ft back-of-curb to back-of-curb, with 2-ft wide curb & gutter. The roadway will have asphaltic cement pavement and all necessary storm water appurtenances.

Item No.	Description	Qty	Unit	Unit Price	Total
<b>Pavement</b>					
1	Linear Grading and Subgrade Preparation	4600	SY	\$60.00	\$276,000.00
2	Type 1 Aggregate Base (16" Thick)	18,400	SY	\$12.00	\$220,800.00
3	1 3/4" Surface Course Bituminous Pavement	18,400	SY	\$7.50	\$138,000.00
4	5" of Bituminous Base Pavement	18,400	SY	\$21.00	\$386,400.00
5	2' Concrete Curb & Gutter	4,600	LF	\$20.00	\$92,000.00
<b>Drainage</b>					
6	24" Class III RCP	5,290	LF	\$60.00	\$317,400.00
7	Precast Drop Inlets	32	EA	\$3,000.00	\$96,000.00
8	Culvert Construction	60	LF	\$1,500.00	\$90,000.00
<b>Miscellaneous</b>					
9	5' Concrete Sidewalk	4,600	LF	\$30.00	\$138,000.00
10	Seed & Mulch	9,200	SY	\$2.00	\$18,400.00
				SubTotal =	\$1,773,000
				Contingency (20%) =	\$354,600
				Construction Subtotal =	\$2,127,600
				Design Engineering (6.0%) =	\$127,656
				Bidding & Construction Engineering (75% of Design) =	\$95,742
				<b>Opinion of Probable Project Cost =</b>	<b>\$2,350,998</b>
				Roadway Length (ft)	4,600
				Cost per Foot	\$511

General Note: Does not include right-of-way acquisition

**Table 5A: Martin Springs Drive Improvements  
Opinion of Probable Cost Breakdown**

Improvements include widening approximately 5,800 lineal feet to 40' commercial roadway w/ curb & gutter. Existing sidewalk and gutter on south side to remain (approx. 4,000 LF)

Item No.	Description	Qty	Unit	Unit Price	Total
<b>Pavement</b>					
1	Linear Grading & Subgrade Preparation	5,800	LF	\$30.00	\$174,000.00
2	Widening of Existing Pavement	8,630	SY	\$33.00	\$284,790.00
3	1 3/4" Surface Course Bituminous Pavement	23,200	SY	\$7.50	\$174,000.00
4	2' Concrete Curb & Gutter	7,600	LF	\$20.00	\$152,000.00
5	Milling of Existing Pavement	14,590	SY	\$2.00	\$29,180.00
<b>Drainage</b>					
6	Storm Sewer RCP	5,500	LF	\$60.00	\$330,000.00
7	Precast Drop Inlets	24	EA	\$3,000.00	\$72,000.00
<b>Utilities</b>					
8	Signalized Intersection	1	EA	\$175,000.00	\$175,000.00
<b>Miscellaneous</b>					
9	5' Concrete Sidewalk	1,800	LF	\$30.00	\$54,000.00
				SubTotal =	\$1,444,970
				Contingency (20%) =	\$288,994
				Construction Subtotal =	\$1,733,964
				Design Engineering (6.25%) =	\$108,373
				Bidding & Construction Engineering (75% of Design) =	\$81,280
				<b>Opinion of Probable Project Cost =</b>	<b>\$1,923,616</b>
				Roadway Length	5,800
				Cost Per Foot	\$332

General Note: Does not include right-of-way acquisition

Table 6A: Old Wire Road Extension  
Opinion of Probable Cost Breakdown

Extend Old Wire Road approximately 5,800 L.F. Roadway will be 40-ft back-of-curb to back-of-curb, with 2-ft wide curb & gutter. The roadway will have asphaltic cement pavement and all necessary storm water appurtenances.

Item No.	Description	Qty	Unit	Unit Price	Total	
<b>Pavement</b>						
1	Linear Grading and Subgrade Preparation	5,800	SY	\$60.00	\$348,000.00	
2	Type 1 Aggregate Base (16" Thick)	23,200	SY	\$12.00	\$278,400.00	
3	1 3/4" Surface Course Bituminous Pavement	23,200	SY	\$7.50	\$174,000.00	
4	5" of Bituminous Base Pavement	23,200	SY	\$21.00	\$487,200.00	
5	2' Concrete Curb & Gutter	11,600	LF	\$20.00	\$232,000.00	
<b>Drainage</b>						
6	24" Class III RCP	6,670	LF	\$60.00	\$400,200.00	
7	Precast Drop Inlets	40	EA	\$3,000.00	\$120,000.00	
<b>Miscellaneous</b>						
8	5' Concrete Sidewalk	5,800	LF	\$30.00	\$174,000.00	
9	Seed & Mulch	11,600	LF	\$2.00	\$23,200.00	
					SubTotal =	\$2,237,000
					Contingency (20%) =	\$447,400
					Construction Subtotal =	\$2,684,400
					Design Engineering (5.75%) =	\$154,353
					Bidding & Construction Engineering (75% of Design) =	\$115,765
					<b>Opinion of Probable Project Cost =</b>	<b>\$2,954,518</b>

General Note: Right of Way acquisition not included in cost estimate.

Roadway Length (ft) 5,800  
Cost Per Foot \$509

Table 7A: Old Wire Road Improvements  
Opinion of Probable Cost Breakdown

Improvements include widening approximately 3,000 lineal feet to 40' commercial roadway w/ curb & gutter on both sides, and sidewalk on one side.

Item No.	Description	Qty	Unit	Unit Price	Total
<b>Pavement</b>					
1	Linear Grading & Subgrade Preparation	3,000	LF	\$30.00	\$90,000.00
2	Widening of Existing Pavement	4,670	SY	\$33.00	\$154,110.00
3	1 3/4" Surface Course Bituminous Pavement	12,000	SY	\$7.50	\$90,000.00
4	2' Concrete Curb & Gutter	6,000	LF	\$20.00	\$120,000.00
5	Milling of Existing Pavement	7,330	SY	\$2.00	\$14,660.00
<b>Drainage</b>					
6	Storm Sewer RCP	6,900	LF	\$60.00	\$414,000.00
7	Precast Drop Inlets	20	EA	\$3,000.00	\$60,000.00
<b>Miscellaneous</b>					
8	5' Concrete Sidewalk	3,000	LF	\$30.00	\$90,000.00
9	Drive Entrances	7	EA	\$3,850.00	\$26,950.00

SubTotal = \$1,059,720  
Contingency (20%) = \$211,944  
Construction Subtotal = \$1,271,664  
Design Engineering (6.25%) = \$79,479  
Bidding & Construction Engineering (75% of Design) = \$59,609

**Opinion of Probable Project Cost = \$1,410,752**

General Note: Right of Way acquisition not included in cost estimate.

Roadway Length 3,000  
Cost Per Foot \$470

Table 8A: Gaddy Road Extension  
Opinion of Probable Cost Breakdown



Extend Gaddy Road approximately 3,800 L.F. Roadway will be 40-ft back-of-curb to back-of-curb, with 2-ft wide curb & gutter. The roadway will have asphaltic cement pavement and all necessary storm water appurtenances.

Item No.	Description	Qty	Unit	Unit Price	Total
<b>Pavement</b>					
1	Linear Grading and Subgrade Preparation	3,800	SY	\$60.00	\$228,000.00
2	Type 1 Aggregate Base (16" Thick)	15,200	SY	\$12.00	\$182,400.00
3	1 3/4" Surface Course Bituminous Pavement	15,200	SY	\$7.50	\$114,000.00
4	5" of Bituminous Base Pavement	15,200	SY	\$21.00	\$319,200.00
5	2' Concrete Curb & Gutter	7,600	LF	\$20.00	\$152,000.00
<b>Drainage</b>					
6	24" Class III RCP	4,370	LF	\$60.00	\$262,200.00
7	Precast Drop Inlets	26	EA	\$3,000.00	\$78,000.00
8	Culvert Construction	70	LF	\$1,500.00	\$105,000.00
<b>Utilities</b>					
9	Standard Street Lighting	3,800	LF	\$40.00	\$152,000.00
10	Signalized Intersection	2	EA	\$175,000.00	\$350,000.00
<b>Miscellaneous</b>					
11	5' Concrete Sidewalk	3,800	LF	\$30.00	\$114,000.00
12	Seed & Mulch	3,800	SY	\$2.00	\$7,600.00

SubTotal = \$2,064,400  
 Contingency (20%) = \$412,880  
 Construction Subtotal = \$2,477,280  
 Design Engineering (6.00%) = \$148,637  
 Bidding & Construction Engineering (75% of Design) = \$111,478  
**Opinion of Probable Project Cost = \$2,737,394**

General Note: Right of Way acquisition and interstate overpass not included in cost estimate. Includes signals at off-ramps.

Roadway Length (ft) 3,800  
 Cost Per Foot \$720

Table 9A: Gaddy Road Improvements  
Opinion of Probable Cost Breakdown

Improvements include widening approximately 2,900 lineal feet to 40' commercial roadway w/ curb & gutter and sidewalks on both sides.

Item No.	Description	Qty	Unit	Unit Price	Total
<b>Pavement</b>					
1	Linear Grading & Subgrade Preparation	2,900	LF	\$38.00	\$110,200.00
2	16" of Type 1 Aggregate Base	11,600	SY	\$12.00	\$139,200.00
3	5" Bituminous Base & 1 3/4" BP-1 Pavement	11,600	SY	\$28.50	\$330,600.00
4	2' Concrete Curb & Gutter	5,800	LF	\$15.00	\$87,000.00
5	Demolition of Existing Pavement	6,770	SY	\$6.00	\$40,620.00
<b>Drainage</b>					
6	Storm Sewer RCP	3,335	LF	\$60.00	\$200,100.00
7	Precast Drop Inlets	19	EA	\$3,000.00	\$57,000.00
8	Culvert Replacement	60	LF	\$1,500.00	\$90,000.00
<b>Miscellaneous</b>					
9	5' Concrete Sidewalk	5,800	LF	\$30.00	\$174,000.00
10	Utility Relocate	1	LS	\$81,200.00	\$81,200.00

SubTotal = \$1,309,920  
 Contingency (20%) = \$261,984  
 Construction Subtotal = \$1,571,904  
 Design Engineering (6.25%) = \$98,244  
 Bidding & Construction Engineering (75% of Design) = \$73,683

**Opinion of Probable Project Cost = \$1,743,831**

General Note: Right of Way acquisition not included in cost estimate.

Roadway Length 2,900  
 Cost Per Foot \$601

Table 10A: Sally Road Improvements  
Opinion of Probable Cost Breakdown

Improvements include widening approximately 2,700 lineal feet to 40' commercial roadway w/ curb & gutter. Sidewalks on both sides and overlay 6" on existing chip & seal road. Replace existing sidewalk on east side.

Item No.	Description	Qty	Unit	Unit Price	Total
<b>Pavement</b>					
1	Linear Grading & Subgrade Preparation	2,700	LF	\$38.00	\$102,600.00
2	16" of Type 1 Aggregate Base	10,800	SY	\$12.00	\$129,600.00
3	5" Bituminous Base and 1 3/4" BP-1 Pavement	10,800	SY	\$28.50	\$307,800.00
4	2' Concrete Curb & Gutter	5,400	LF	\$20.00	\$108,000.00
5	Demolition of Existing Pavement	7,050	SY	\$6.00	\$42,300.00
<b>Drainage</b>					
6	Storm Sewer RCP	3,105	LF	\$60.00	\$186,300.00
7	Precast Drop Inlets	20	EA	\$3,000.00	\$60,000.00
8	Culvert Extension	30	LF	\$1,000.00	\$30,000.00
9	Culvert Replacement	60	LF	\$1,500.00	\$90,000.00
<b>Miscellaneous</b>					
10	5' Concrete Sidewalk	5,400	LF	\$30.00	\$162,000.00
11	Utilities Relocate	1	LS	\$75,600	\$75,600.00

SubTotal = \$1,294,200  
 Contingency (20%) = \$258,840  
 Construction Subtotal = \$1,553,040  
 Design Engineering (6.25%) = \$97,065  
 Bidding & Construction Engineering (75% of Design) = \$72,799

**Opinion of Probable Project Cost = \$1,722,904**

Roadway Length 2,700  
 Cost Per Foot \$638

General Note: Right of Way acquisition not included in cost estimate.

Table 11A: Vista Drive Improvements  
Opinion of Probable Cost Breakdown

Replace existing Vista Drive road way, from Highway E to 1,485 L.F. to the south. Extend Vista Drive approximately 2,855 L.F. to the South and connect to Old Wire Road. Proposed roadway will be 40-ft back-of-curb to back-of-curb, with 2-ft wide curb & gutter. The roadway will have asphaltic cement pavement and all necessary storm water appurtenances.

Item No.	Description	Qty	Unit	Unit Price	Total
<b>Pavement</b>					
1	Linear Grading and Subgrade Preparation	2855	LF	\$60.00	\$171,300.00
2	Linear Grading and Subgrade Prep - Replacement	1485	LF	\$20.00	\$29,700.00
3	Milling of Existing Pavement	4620	SY	\$2.00	\$9,240.00
4	Type 1 Aggregate Base (16" Thick)	14670	SY	\$12.00	\$176,040.00
5	1 3/4" Surface Course Bituminous Pavement	19300	SY	\$7.50	\$144,750.00
6	5" of Bituminous Base Pavement	14670	SY	\$21.00	\$308,070.00
7	2' Concrete Curb & Gutter	8680	LF	\$20.00	\$173,600.00
<b>Drainage</b>					
8	24" Class III RCP	4995	LF	\$60.00	\$299,700.00
9	Precast Drop Inlets	15	EA	\$3,000.00	\$45,000.00
10	Culvert Construction	240	LF	\$300.00	\$72,000.00
<b>Miscellaneous</b>					
11	5' Concrete Sidewalk	4340	LF	\$30.00	\$130,200.00
12	Seed & Mulch	9650	SY	\$2.00	\$19,300.00

SubTotal = \$1,578,900  
 Contingency (20%) = \$315,780  
 Construction Subtotal = \$1,894,680  
 Design Engineering (6.0%) = \$113,681  
 Bidding & Construction Engineering (75% of Design) = \$85,261

**Opinion of Probable Project Cost = \$2,093,621**

Roadway Length (ft) 4,340  
 Cost Per Foot \$482

General Note: Right of Way acquisition not included in cost estimate.



# Appendix B

## Transportation Recommendations - East Side

A workshop was held on October 1, 2008 with city staff to discuss transportation on the east side of the Rolla West study area. This area is currently undergoing changes in land use and transportation. Specifically, Missouri University S&T is redeveloping their existing golf course into a technology research park, Ridgeview Drive is planned to be extended from Highway 72 and US 63 west to connect with Kingshighway and aesthetic and capacity improvements to Kingshighway are being discussed as Kingshighway is one of the key gateways into the community. The following provides a discussion related to each of these topics:

- Missouri University S&T Research Park
- Ridgeview Extension
- Kingshighway Improvements

### Missouri S&T Research Park

Missouri University S&T is planning to redevelop the existing golf course located north of Kingshighway, south of 10th Street, east of Fairgrounds Road and west of US 63. The site is planned to be a university technology research park with office and labs occupying the area. The proposed site plan is shown in Exhibit 1B. The transportation system was analyzed in regards to the impact to the peripheral street system.

The site plan shows a north-south road that connects 10th Street to Kingshighway. An initial phase would build an east-west road that would terminate into a cul-de-sac. Ultimately, a connection to Kingshighway is proposed, as shown with the dashed line.

### Site Generated Traffic

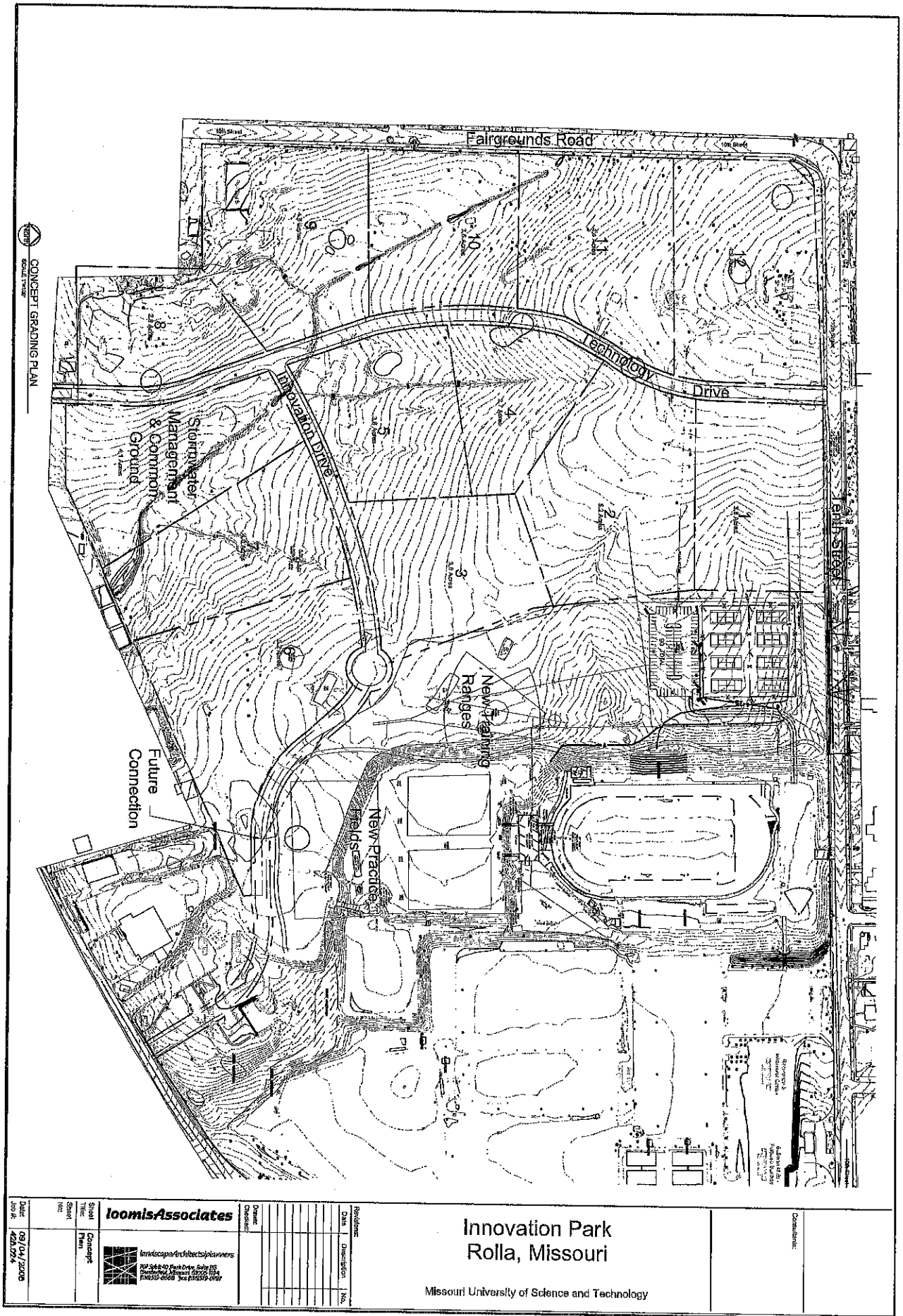
The ITE Trip Generation Manual (ver. 7) was used to calculate the number of vehicle trips expected to be generated by the site. Two independent variables (square feet of development and employees) were used to estimate vehicle trips. As shown in Table 1, the research park is estimated to generate up to 5,776 daily vehicles, 835 AM Peak Hour vehicles and 828 PM Peak Hour vehicles.

Table 1B: Missouri S&T Research Park Traffic Generation

Land Use	Size	Unit	Daily Traffic			AM Peak Hour			PM Peak Hour		
			Total	Entering	Existing	Total	Entering	Existing	Total	Entering	Existing
Research and Development Center				50%	50%		83%	17%		15%	85%
	543,400	square feet	4041	2020	2020	615	511	105	538	81	457
Research and Development Center				50%	50%		86%	14%		10%	90%
	2,445	employee*	5776	2888	2888	835	718	117	828	83	746

Traffic generated by the site will be added to the existing roadway network. Currently Kingshighway operates at capacity and US 63 operates near capacity. Existing traffic volumes surrounding the research park are shown in Exhibit 2B.

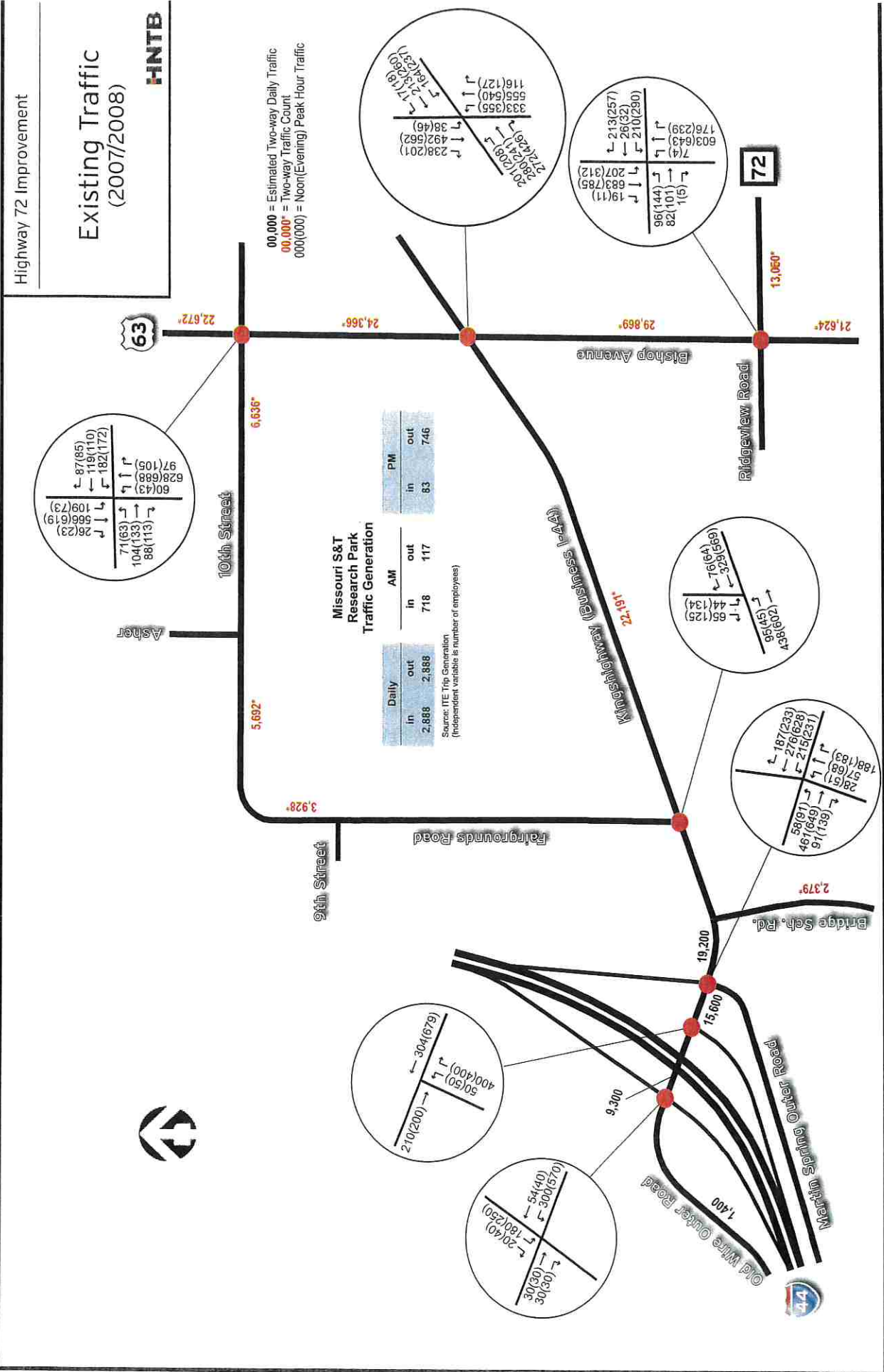
**Exhibit 1B: Innovation Park Site Plan**



<p><b>loomisAssociates</b></p> <p><b>loomiscapsaarchitectsplanners</b></p> <p>107 S. 4th St. Rolla, MO 65801</p> <p>Phone: 660-838-2222 Fax: 660-838-2222</p>	<p><b>Revisions:</b></p> <table border="1"> <thead> <tr> <th>Date</th> <th>Description</th> <th>No.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Date	Description	No.													<p><b>Innovation Park</b> Rolla, Missouri</p> <p>Missouri University of Science and Technology</p>	<p><b>Comments:</b></p>
Date	Description	No.																
<p>Date: 08/04/2008</p> <p>Scale: 1" = 20'</p>	<p>Author: [Blank]</p> <p>Checker: [Blank]</p> <p>Drawn: [Blank]</p>	<p>State Title: [Blank]</p> <p>Concept Title: [Blank]</p> <p>Sheet No.: [Blank]</p>	<p>Comments:</p>															

Source: Missouri S&T

Exhibit 2B: Existing Traffic



## Traffic Assessment

The number of vehicle trips generated by the site would require additional transportation improvements to serve the increase in traffic from the Research Park. For example, a traffic signal on Kingshighway at Technology Drive would be necessary to serve the Research Park based on the proposed street network. However, adding a traffic signal on Kingshighway in proximity (approximately 700 feet) to the existing Fairgrounds Road traffic signal is undesirable from a safety and traffic operations perspective. An alternative would be to realign Technology Drive to the west from Juliene Street to Bryant Drive. This new intersection would be controlled by a traffic signal and the existing traffic signal at Fairgrounds Road would be removed. This new configuration would have a number of benefits including:

- Increased traffic signal spacing from the I-44 Interchange
- Improved connection to the planned Ridgeview extension

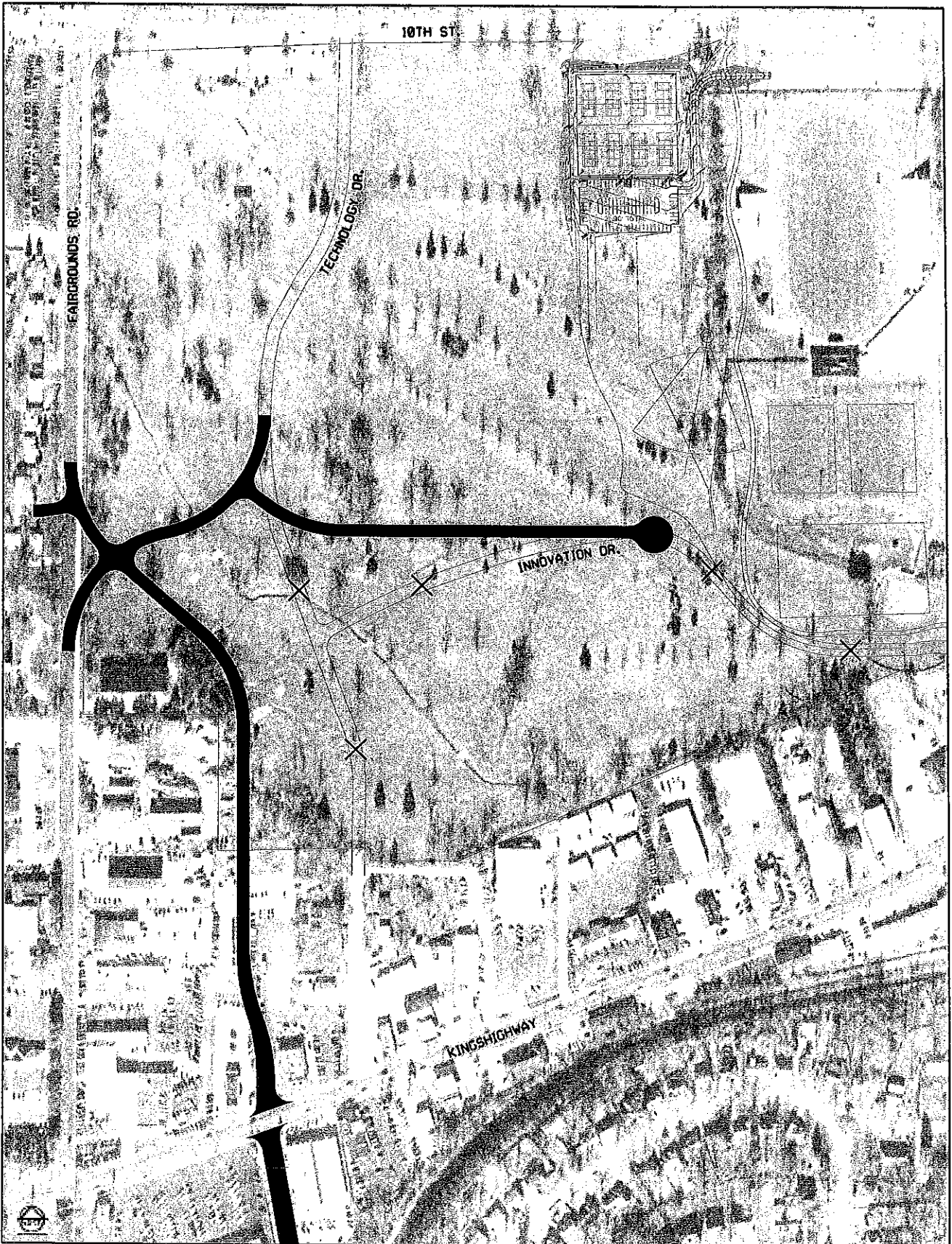
In addition, the proposed connection on the east-side of the research park should be eliminated because it does not serve any new parcels and would be located too close (approximately 550 feet) to the US 63 and Kingshighway intersection. The intersection of US 63 and Kingshighway currently operates near capacity and often has long queues that extend west along Kingshighway. Adding an additional access point with a traffic signal at this proposed location would create undesirable safety and traffic operations. An access controlled right-in, right-out intersection may be an alternative.

The proposed development will increase volumes at the 10th Street and US 63 intersection. The current lane configuration at this intersection will not have the necessary capacity to handle the additional traffic generated by the proposed development. Currently, the intersection operates at LOS B during the PM peak hour but with the additional technology research park traffic volumes, the intersection is expected to operate at LOS F. The eastbound approach to the 10th Street and US 63 intersection will have the greatest impact from the increase in traffic volumes from the Research Park.

## Recommendations

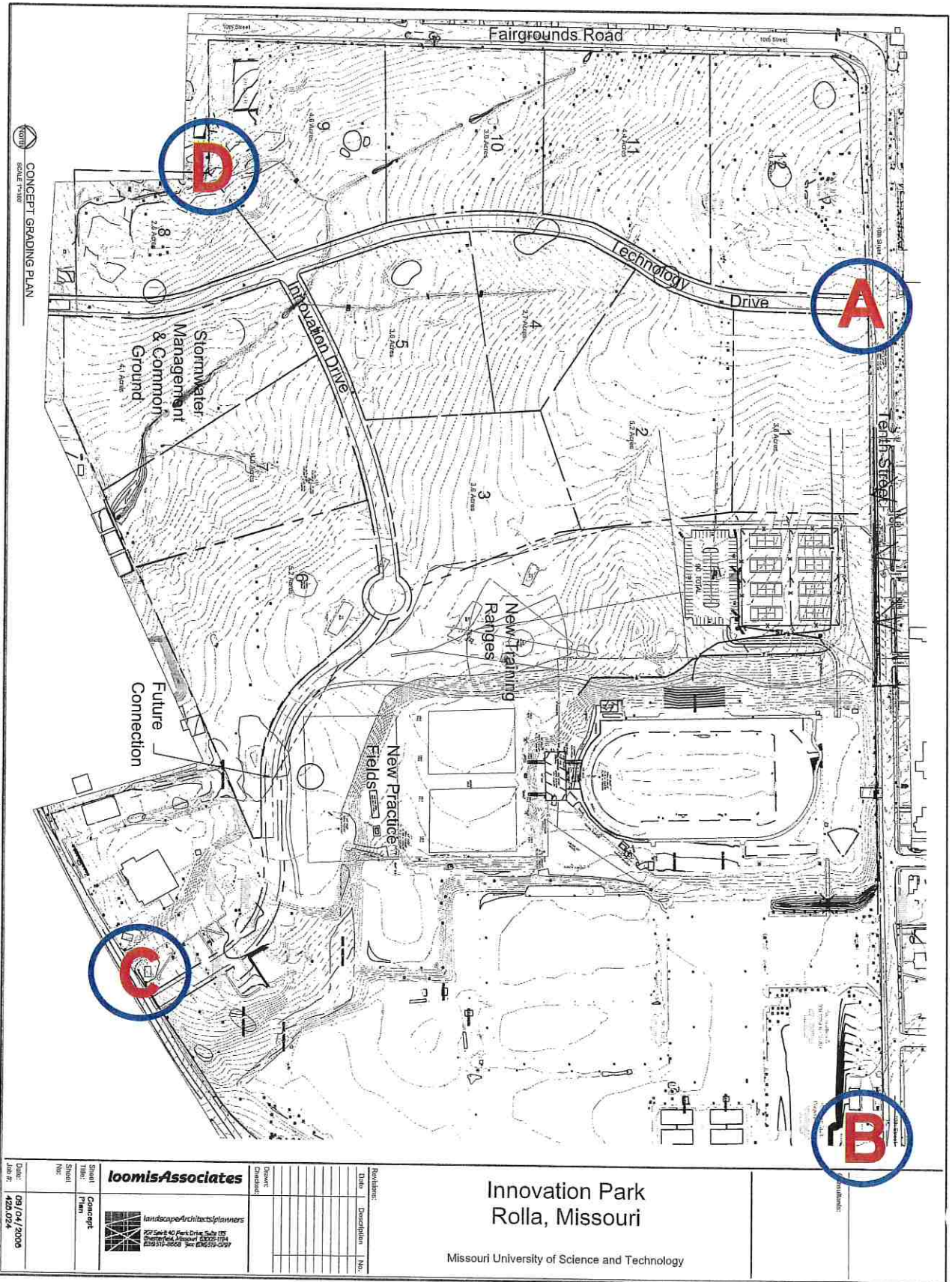
In order to preserve the safety and traffic operations of Kingshighway, the study team identified an alternative research park roadway network. The alternative roadway network is shown in Exhibit 3B. The alternative roadway network relocates Technology Drive west to better align with a connection with the planned Ridgeview extension at Bryant Drive, south of Kingshighway.

Exhibit 3B: Innovation Park Internal Road Network Alternative



Each of the four zones (A through D) shown on Exhibit 4B represent locations where Transportation improvements have been identified and are discussed below.

**Exhibit 4B: Innovation Park Potential Improvement Zones**



A – Technology Drive connection to 10th Street at this location is reasonable. Technology Drive would line up across the street from the doctors parking lot of Phelps County Regional Medical Center. A meeting with the hospital indicated that this intersection location was acceptable to them and did not impact their future master plans. The intersection is anticipated to be a 2-way stop control.

B – The intersection of 10th Street and US 63 currently operates at a desirable LOS B in the PM peak hour. With the Missouri University S&T Technology Research Park traffic added to the intersection, the intersection level of service is expected to be reduced to level of service F. In particular the traffic operation on the eastbound approach is expected to worsen with the additional traffic volumes generated by the technology park. A separate right-turn lane on the west leg of 10th Street will provide the additional necessary capacity to maintain an approach LOS D and an overall intersection LOS C.

C – The future connection of Innovation Drive to Kingshighway is discouraged at this location. Additional traffic signals along Kingshighway would degrade the current safety and operations of the corridor. In addition, the proximity of the proposed connection would impact the safety and operations of the Kingshighway and US 63 intersection.

D – Technology Drive is realigned to Bryant Drive. A new traffic signal would be located on Kingshighway and the existing traffic signal at Kingshighway and Fairgrounds would be removed. Exhibit 3B shows the proposed modified roadway network.

Table 2B shows the preliminary construction cost estimate for Technology Drive from Fairgrounds Road to Kingshighway.

Table 2B: Technology Drive from Fairgrounds Road to Kingshighway Preliminary Quantity and Cost Estimate (2008 Dollars)

ITEM	UNIT	COST PER UNIT	QUANTITY	TOTAL COST	ASSUMPTIONS/COMMENTS
<b>BASE &amp; SURFACE</b>					
7" Concrete Roadway	SY	\$25.00	7900	\$197,500.00	
2' Curb and Gutter	LF	\$22.00	4400	\$96,800.00	
4" Aggregate Base	SY	\$6.45	8500	\$54,825.00	
4' Concrete Sidewalk Both Sides	SY	\$3.71	16200	\$60,102.00	
<b>GRADING &amp; DRAINAGE</b>					
(MoDOT Preliminary Estimate Guide)	Mile	\$650,000.00	0.41	\$267,140.15	
<b>INTERSECTIONS</b>					
Traffic Signals	LS				Traffic Signal in Ridgeview Road Extension
<b>CONSTRUCTION COST SUBTOTAL</b>				<b>\$676,367.15</b>	
<b>CONTINGENCY</b>				<b>\$67,636.72</b>	(10% of Construction Cost Subtotal)
<b>CONSTRUCTION COST TOTAL</b>				<b>\$744,003.87</b>	

**Assumptions:**

1. The following items will not be required or will be covered by contingency: Class 3 Excavation, Underdrains, and Utility Relocations.
2. 35 ft. roadbed for grading and drainage.
3. Length (L.F.) = 2,170
4. 2-lane per standard 201

**Disclaimer:**

These estimates were calculated from our experience and represent our best judgment as Design Professionals. Therefore, HNTB can not guarantee that future construction costs will vary from those given herein.

## Ridgeview Extension

The Ridgeview extension is planned to extend from the intersection of US 63 and Highway 72 west. The purpose of this road is to provide improved east-west mobility in Rolla. However, the connection to the west has been unknown up to this point. The US 63 Bypass EIS identified the Ridgeview extension as a bypass to Kingshighway and US 63 providing access for US 63 traffic from the south and US 72 traffic from the east with a limited access road that would provide quick access to I-44 from US 63 and Highway 72. Through the Rolla West master planning process, the community identified the desire for the Ridgeview extension to provide access to the new Rolla West study area. As a result, there is a desire for the Ridgeview extension to connect to both Kingshighway and Bridge School Road on the west-side. Physical constraints of the BNSF railroad and existing businesses located on the south side of Kingshighway have made connections to both Kingshighway and Bridge School Road difficult.

Building on the work of the community during the Rolla West master planning workshops, an alternative alignment for Ridgeview that crosses the railroad and connects to Bryant Drive for a connection to Kingshighway and Bridge School Road for a connection to Rolla West was developed. Exhibit 6B shows the roadway network with the Rolla West Master Plan.

Exhibit 5B shows the proposed Ridgeview extension which connects US 63 and US 72 to both Kingshighway and Bridge School Road. Table 3 shows the preliminary construction cost estimate for the Ridgeview Road extension shown.

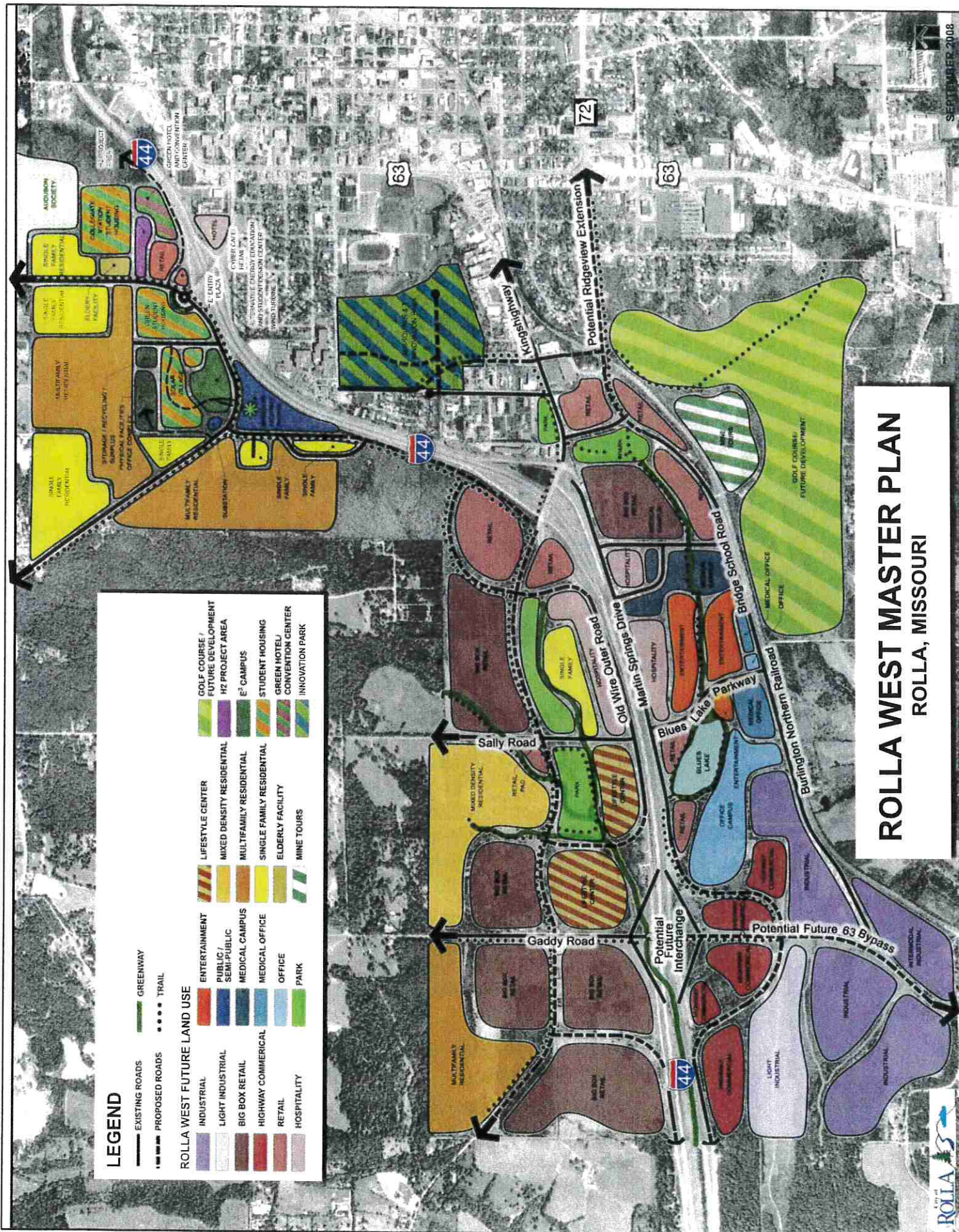
Exhibit 5B: Ridgeview Road Extension



See Table 3B on Page B-10 for the Ridgeview Road Extension preliminary quantity and cost estimate .



Exhibit 6B: Rolla West Master Plan



**LEGEND**

—	EXISTING ROADS	—	GREENWAY
- - -	PROPOSED ROADS	•••••	TRAIL
<b>ROLLA WEST FUTURE LAND USE</b>			
[Light Blue]	INDUSTRIAL	[Red]	ENTERTAINMENT
[Light Purple]	LIGHT INDUSTRIAL	[Dark Blue]	PUBLIC / SEMI-PUBLIC
[Light Green]	BIG BOX RETAIL	[Light Blue]	MEDICAL CAMPUS
[Light Yellow]	HIGHWAY COMMERCIAL	[Light Green]	MEDICAL OFFICE
[Light Orange]	RETAIL	[Light Blue]	OFFICE
[Light Purple]	HOSPITALITY	[Light Green]	PARK
[Light Blue]	LIFESTYLE CENTER	[Light Green]	GOLF COURSE / FUTURE DEVELOPMENT
[Light Orange]	MIXED DENSITY RESIDENTIAL	[Light Green]	H2 PROJECT AREA
[Light Purple]	MULTIFAMILY RESIDENTIAL	[Light Green]	E' CAMPUS
[Light Yellow]	SINGLE FAMILY RESIDENTIAL	[Light Green]	STUDENT HOUSING
[Light Orange]	ELDERLY FACILITY	[Light Green]	GREEN HOTEL CONVENTION CENTER
[Light Purple]	MINE TOURS	[Light Green]	INNOVATION PARK

**ROLLA WEST MASTER PLAN**  
ROLLA, MISSOURI



Table 3B: Ridgeview Extension  
Preliminary Quantity and Cost Estimate (2008 Dollars)

ITEM	UNIT	COST PER UNIT	QUANTITY	TOTAL COST	ASSUMPTIONS/COMMENTS	
<b>BASE &amp; SURFACE</b>						
10" P.C. Concrete (Non-Reinforced)	s.y.	\$ 34.23	12,418	\$ 425,068.14		
Type A2 Shoulder	s.y.	\$ 24.00	8,905	\$ 213,720.00		
4" Type 5 Aggregate Base	s.y.	\$ 6.45	21,322	\$ 137,526.90		
PCC Sidewalk - 4"	s.f.	\$ 3.71	15,679	\$ 58,169.09		
<b>GRADING &amp; DRAINAGE</b>						
New 2 Lane (MoDOT Preliminary Estimate Guide)	mile	\$ 650,000.00	0.86	\$ 559,000.00		
<b>INTERSECTIONS</b>						
Traffic Signal	l.s.	\$ 250,000.00	1.00	\$ 250,000.00		
<b>ROADWAY CONSTRUCTION COST</b>				<b>\$ 1,643,484.13</b>		
<b>BRIDGE STRUCTURES</b>						
Conspan Precast Bridge System						
Precast Concrete Bridge Units, Installed	l.f.	\$ 4,700.00	152.0	\$ 714,400.00	19 Conspan Units @ 8' Lengths (Includes Pedestal Walls)	
Wing Walls	l.s.	\$ 75,000.00	1.0	\$ 75,000.00		
Spread Footings	l.s.	\$ 100,000.00	1.0	\$ 100,000.00		
Double 12' X 10' Box Culvert	l.s.	\$ 250,000.00	1.0	\$ 250,000.00		
<b>BRIDGE CONSTRUCTION COST</b>				<b>\$ 1,139,400.00</b>		
				<b>Contingency</b>	<b>\$ 278,288.41</b>	Assume 10% of construction subtotal.
<b>CONSTRUCTION COST TOTAL</b>				<b>\$ 3,061,172.54</b>		

**Assumptions:**

1. The following items will not be required or will be covered by contingency: Class 3 Excavation, Underdrains, Guardrail, Paved Ditch, Ditch Liner.
2. 2' Cover over bridge, HS20-44 Loading, Soil Bearing 10,000 PSF
3. Assume 44 ft. Roadbed for grading and drainage.

**Disclaimer:**

These estimates were calculated from our experience and represent our best judgment as Design Professionals. Therefore, HNTB can not guarantee that future construction costs will vary from those given herein.

**Kingshighway Improvements**

There is a need to improve transportation for all modes (vehicular, pedestrian, bicycle) throughout the Kingshighway corridor. A comprehensive approach to this problem is referred to as **Complete Streets**. Complete Streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and bus riders of all ages and abilities are able to safely move along and across a complete street. The complete streets concept is growing throughout the United States. One resource to find more information is at [www.completestreets.org](http://www.completestreets.org).

The existing roadway has a 70-foot ROW through the study area with traffic lanes that consist of one travel lane each way with a center turn lane. The travel lanes are approximately 15-feet wide each, with the center turn lane being 15-feet wide. The total pavement width for the existing roadway is 45-feet back of curb to back of curb.

Two concepts for the future widening and enhancement of the Kingshighway corridor were developed:

- **Concept A:** Two 12-foot wide travel lanes each direction of traffic, with a 12-14-foot wide center landscaped median and center turn lane.
- **Concept B:** Two 12-foot wide travel lanes each direction of traffic, with a 12-14-foot wide center turn lane and no medians.

Both of these concepts will require an additional 6-feet of landscape and sidewalk easements on both sides of Kingshighway extending the existing 70-foot right-of-way (ROW) to a combined total of 82-feet of ROW and easement area. Each side of Kingshighway in both of the scenarios is proposed to have a 5-foot wide sidewalk and a 5-foot wide turf parkway area between the sidewalks and curb. The expansion of the roadway will require reconfiguration of some existing parking lots affected by the improvements.

Some of the common goals of these two concepts are:

- Removal of excessive curb cuts to help the traffic flow / access management issues and improve the overall aesthetics of the roadway by creating more opportunities for landscape and turf areas.
- Consistent street tree plantings throughout the corridor to create a continuity of visual elements.
- Reduction of visual clutter through the implementation of a future signage ordinance, with requirements for consistent materials and size restrictions to promote unifying design elements.
- Potential to relocate overhead utilities underground to reduce visual clutter.
- Propose an ornamental light standard that is consistent throughout the corridor adding the opportunity for seasonal and festival banners.
- Improve the pedestrian environment through way finding signage.
- Consistent pedestrian bench and site furnishings throughout the corridor.

Exhibit 7B: Existing Kingshighway Looking Northeast



Exhibit 8B: 4-Lane Divided Enhancement of Kingshighway Looking Northeast



Exhibit 9B: 4-Lane with Center Turn Lane Enhancement of Kingshighway Looking Northeast



Table 4b shows the preliminary construction cost estimate for the Kingshighway widening to a 5-lane roadway with a center turn lane from Technology Drive to the E. Outer Road/NB On-Ramp.



Table 4B: Kingshighway Widening - 5 Lane with Center Turn Lane  
Technology Drive to E. Outer Road/NB On-Ramp  
Preliminary Quantity and Cost Estimate (2008 Dollars)

ITEM	UNIT	COST PER UNIT	QUANTITY	TOTAL COST	ASSUMPTIONS/COMMENTS
<b>BASE &amp; SURFACE</b>					
10" Concrete Roadway	SY	\$45.00	8500	\$382,500.00	
2' Curb and Gutter	LF	\$22.00	2800	\$61,600.00	
8" Concrete Driveway	SY	\$27.38	600	\$16,428.00	
4" Aggregate Base	SY	\$6.45	9200	\$59,340.00	
5' Concrete Sidewalk Each Side	SF	\$3.71	13900	\$51,569.00	
<b>GRADING &amp; DRAINAGE</b>					
(MoDOT Preliminary Estimate Guide)	Mile	\$650,000.00	0.26	\$171,363.64	
<b>INTERSECTIONS</b>					
Traffic Signals	LS				Traffic Signal in Ridgeview Road Extension
<b>CONSTRUCTION COST SUBTOTAL</b>				<b>\$742,800.64</b>	
<b>CONTINGENCY</b>				<b>\$74,280.06</b>	(10% of Construction Cost Subtotal)
<b>CONSTRUCTION COST TOTAL</b>				<b>\$817,080.70</b>	

Assumptions:

1. Assumes the following items will not be required or will be covered by contingency: Class 3 Excavation, Under drains, Guardrail, Paved Ditch, Ditch Liner.
2. 2' Cover over bridge, HS20-44 Loading, Soil Bearing 10,000 PSF
3. Assume 44 ft. Roadbed for grading and drainage.
4. Length (L.F.) = 1,392

Disclaimer:

These estimates were calculated from our experience and represent our best judgment as Design Professionals. Therefore, HNTB can not guarantee that future construction costs will vary from those given herein.



Table 5B shows the preliminary construction cost estimate for the Kingshighway widening to a 5-lane roadway with a center turn lane from Technology Drive to US 63.

Table 5B: Kingshighway Widening - 5 Lane with Center Turn Lane  
Technology Drive to US 63  
Preliminary Quantity and Cost Estimate (2008 Dollars)

ITEM	COST PER		QUANTITY	TOTAL COST	ASSUMPTIONS/COMMENTS
	UNIT	UNIT			
<b>BASE &amp; SURFACE</b>					
10" Concrete Roadway	SY	\$45.00	14600	\$657,000.00	
2' Curb and Gutter	LF	\$22.00	4800	\$105,600.00	
8" Concrete Driveway	SY	\$27.38	1600	\$43,808.00	
4" Aggregate Base	SY	\$6.45	21000	\$135,450.00	
5' Concrete Sidewalk Each Side	SF	\$3.71	24000	\$89,040.00	
<b>GRADING &amp; DRAINAGE</b> (MoDOT Preliminary Estimate Guide)					
	Mile	\$650,000.00	0.45	\$293,731.06	
<b>INTERSECTIONS</b>					
Traffic Signals	LS			\$-	Traffic Signal in Ridgeview Road Extension
<b>CONSTRUCTION COST SUBTOTAL</b>				<b>\$1,324,629.06</b>	
<b>CONTINGENCY</b>				<b>\$132,462.91</b>	(10% of Construction Cost Subtotal)
<b>CONSTRUCTION COST TOTAL</b>				<b>\$1,457,091.97</b>	

Assumptions:

1. Assumes the following items will not be required or will be covered by contingency: Class 3 Excavation, Under drains, Guardrail, Paved Ditch, Ditch Liner.
2. 2' Cover over bridge, HS20-44 Loading, Soil Bearing 10,000 PSF
3. Assume 44 ft. Roadbed for grading and drainage.
4. Length (L.F.) = 2,386

Disclaimer:

These estimates were calculated from our experience and represent our best judgment as Design Professionals. Therefore, HNTB can not guarantee that future construction costs will vary from those given herein.

Table 6B shows the preliminary construction cost estimate for the Kingshighway widening to a 5-lane roadway with a raised median from Technology Drive to the E. Outer Road/NB On-Ramp.



Table 6B: Kingshighway Widening - 5 Lane with Raised Median  
Technology Drive to E. Outer Road/NB On-Ramp  
Preliminary Quantity and Cost Estimate (2008 Dollars)

ITEM	UNIT	COST PER UNIT	QUANTITY	TOTAL COST	ASSUMPTIONS/COMMENTS
<b>BASE &amp; SURFACE</b>					
10" Concrete Roadway	SY	\$45.00	4950	\$222,750.00	
2' Curb and Gutter	LF	\$22.00	4100	\$90,200.00	
8" Concrete Driveway	SY	\$27.38	600	\$16,428.00	
4" Aggregate Base	SY	\$6.45	8600	\$55,470.00	
5' Concrete Sidewalk Each Side	SF	\$3.71	13900	\$51,569.00	
<b>GRADING &amp; DRAINAGE</b>					
(MoDOT Preliminary Estimate Guide)	Mile	\$650,000.00	0.26	\$171,363.64	
<b>INTERSECTIONS</b>					
Traffic Signals	LS		0	\$-	Traffic Signal in Ridgeview Road Extension
<b>CONSTRUCTION COST SUBTOTAL</b>				<b>\$607,780.64</b>	
<b>CONTINGENCY</b>				<b>\$60,778.06</b>	(10% of Construction Cost Subtotal)
<b>CONSTRUCTION COST TOTAL</b>				<b>\$668,558.70</b>	

Assumptions:

1. Assumes the following items will not be required or will be covered by contingency: Class 3 Excavation, Under drains, Guardrail, Paved Ditch, Ditch Liner.
2. 2' Cover over bridge, HS20-44 Loading, Soil Bearing 10,000 PSF
3. Assume 44 ft. Roadbed for grading and drainage.
4. Length (L.F.) = 1,392

Disclaimer:

These estimates were calculated from our experience and represent our best judgment as Design Professionals. Therefore, HNTB can not guarantee that future construction costs will vary from those given herein.

Table 7B shows the preliminary construction cost estimate for the Kingshighway widening to a 5-lane roadway with a raised median from Technology Drive to US 63.

Table 7:B Kingshighway Widening - 5 Lane with Raised Median  
Technology Drive to US 63  
Preliminary Quantity and Cost Estimate (2008 Dollars)

ITEM	COST PER		QUANTITY	TOTAL COST	ASSUMPTIONS/COMMENTS
	UNIT	UNIT			
<b>BASE &amp; SURFACE</b>					
10" Concrete Roadway	SY	\$45.00	11900	\$535,500.00	
2' Curb and Gutter	LF	\$22.00	9500	\$209,000.00	
8" Concrete Driveway	SY	\$27.38	1600	\$43,808.00	
4" Aggregate Base	SY	\$6.45	13600	\$87,720.00	
5' Concrete Sidewalk Each Side	SF	\$3.71	24000	\$89,040.00	
<b>GRADING &amp; DRAINAGE</b> (MoDOT Preliminary Estimate Guide)					
	Mile	\$650,000.00	0.45	\$293,731.06	
<b>INTERSECTIONS</b>					
Traffic Signals	LS		0	\$-	Traffic Signal in Ridgeview Road Extension
<b>CONSTRUCTION COST SUBTOTAL</b>				<b>\$1,258,799.06</b>	
<b>CONTINGENCY</b>				<b>\$125,879.91</b>	(10% of Construction Cost Subtotal)
<b>CONSTRUCTION COST TOTAL</b>				<b>\$1,384,678.97</b>	

Assumptions:

1. Assumes the following items will not be required or will be covered by contingency: Class 3 Excavation, Under drains, Guardrail, Paved Ditch, Ditch Liner.
2. 2' Cover over bridge, HS20-44 Loading, Soil Bearing 10,000 PSF
3. Assume 44 ft. Roadbed for grading and drainage.
4. Length (L.F.) = 2,386

Disclaimer:

These estimates were calculated from our experience and represent our best judgment as Design Professionals. Therefore, HNTB can not guarantee that future construction costs will vary from those given herein.