North Riverfront Commerce Corridor Land Use Plan

St. Louis Development Corporation
St. Louis, Missouri

April 2012

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Abstract

The St. Louis Development Corporation (SLDC) has undertaken the North Riverfront Commerce Corridor Plan to help SLDC promote existing and attract new businesses to the City's North Riverfront. The Study, therefore, comprises market analyses and economic impact studies, infrastructure analysis, strategic options, and implementation and marketing plans.

The Consultant team, led by HNTB, held extensive public and one-on-one meetings with stakeholders to understand their needs, concerns, and goals. Upon formal adoption by the City's Planning and Urban Design Agency, SLDC will use the Study to work with area businesses to create jobs while promoting local and regional commerce.

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EXECUTIVE SUMMARY

NORTH RIVERFRONT COMMERCE CORRIDOR

Location. Connectivity. Opportunity.

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Executive Summary

Plan Area

The North Riverfront Commerce Corridor (NRCC), is a 3,000-acre multi-modal logistics and business district located on the north end of downtown St. Louis.

- The NRCC limits are from Cass Avenue to Maline Creek, and I-70 and North Broadway Street to the Mississippi River.
- The NRCC includes the 27 acre Municipal River Terminal (MRT), the only publicly-owned port facility on the Missouri side of the Mississippi River within the Port of Metropolitan St. Louis (PMSL).
- The St. Louis Port Authority is modernizing and expanding the MRT's docks.

Plan Process

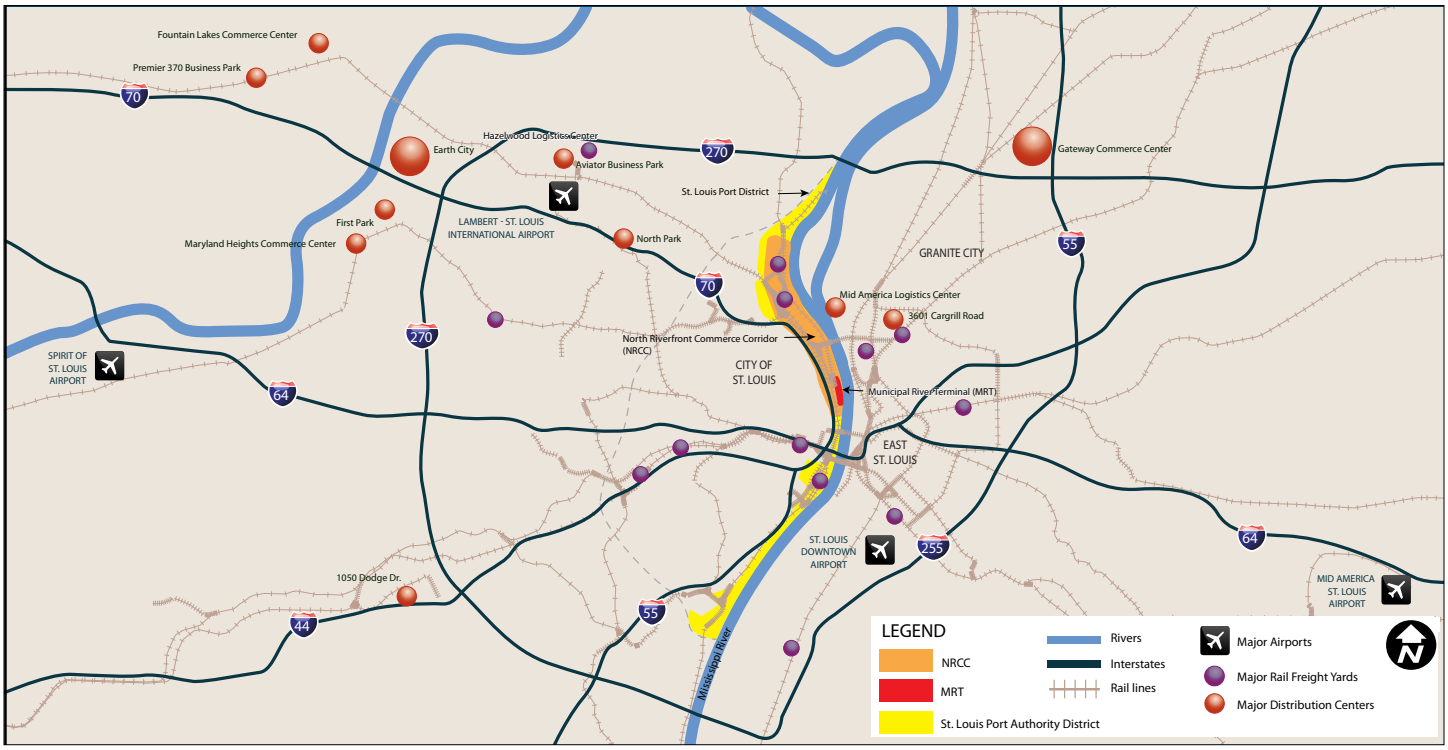
This Plan's recommendations are a result of an inclusive 12-month planning process that identified and addressed the NRCC's weaknesses, challenges, strengths and opportunities. The public process included extensive outreach that included:

- Over 35 private stakeholder meetings
  - North Riverfront businesses
  - Regional partners and agencies
  - Railroads
  - Developers
  - Shipping/river terminal operators
  - Utilities
- Three public workshops

Plan Goals

The Plan identifies strategies and recommendations intended to:

- Attract high-quality jobs by targeting emerging industries and innovative businesses.
- Fully leverage its central location in the region and access to river, rail and highway infrastructure.
- Significantly increase the quantity and diversity of products shipped through the area.
- Provide quality services and unique amenities to remain competitive with emerging inter-modal hubs.
- Leverage the environmental, and recreational assets of the Confluence Greenway Mississippi River corridor to add value for area businesses, improve conditions for employees and provide compatible uses for recreational users.
- Encourage a sustainable business community committed to improvements, programs and initiatives that meet both present and future needs.



Transportation Network

Shipping

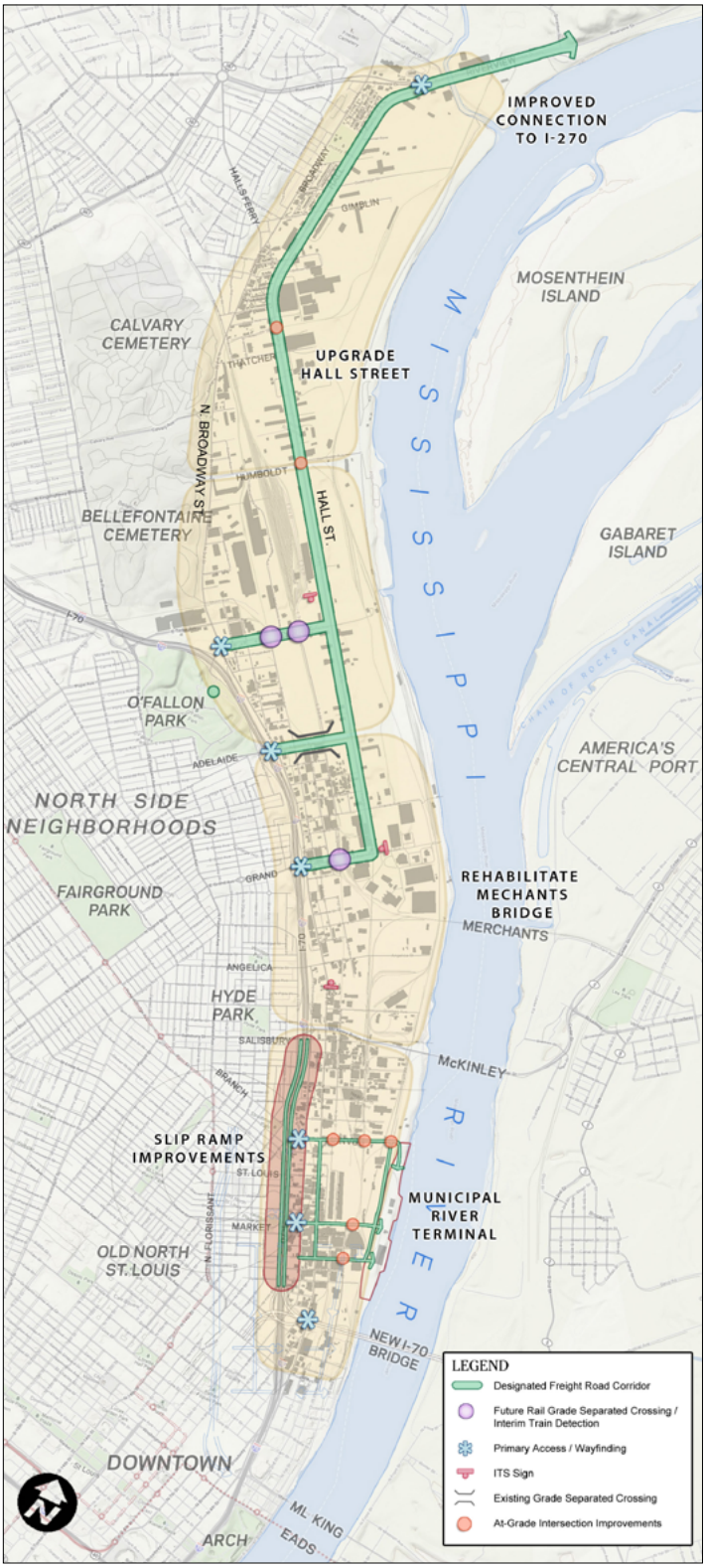
- The St. Louis region is known as a shipping leader using various modes of transportation including rail, truck, water, and air freight. The NRCC is well-positioned to take advantage of the expanding shipping and distribution industry in the region due to the increased capacity of the MRT, improved regional mobility provided by the new Mississippi River Bridge, access to six Class 1 railroads and recent investments by a number of emerging businesses and industries.
- The Plan transportation network improvements are intended to allow shippers to expand existing operations and add/or add new operations that will significantly increase the quantity and diversity of products shipped through the area.

Mobility and Circulation

- Upgrade Hall Street to address localized flooding and to ensure efficient movement of freight traffic.
- Improve connection to I-270. Currently, Hall Street is recommended to be improved within the NRCC. However, to take full advantage of the regional connections, improvements should be considered along Riverview Drive to the interchange at I-270.
- Incorporate ITS signage at strategic locations to alert drivers with a notification when at-grade crossings are blocked by trains. The system will be able to detect the presence of a train blocking street crossings and will allow drivers adequate time to make decisions on an alternative route.
- Improve intersections with at-grade rail crossings. Intersection improvements include mitigating profile deficiencies, integrating ITS signage, upgrading active warning devices/signals and improving pedestrian crossing safety.
- Reconnect streets to improve circulation. Currently, a number of streets are disconnected throughout the NRCC, mainly due to numerous rail crossings and physical development over time. However, some crossings, such as Madison Street near the MRT, have been vacated but are not encumbered by active rail or development.
- Rehabilitate Merchants Bridge. Merchants Bridge, built in the 1889, is functionally deficient and needs repairs. Presently, the bridge can only accommodate one train at a time, for a total of about 25 trains per day. In the short-term, Merchants Bridge will need to be rehabilitated to keep pace with current demand.
- Study the potential for a new rail bridge crossing. Currently, there are two rail bridges that cross the Mississippi River: the MacArthur Bridge and the Merchants Bridge. According to the Terminal Railroad Association, the current owner and operator of both bridges, the MacArthur Bridge is at 80 to 90 percent capacity and Merchants Bridge is in need of significant repair. Repair of Merchants Bridge will meet current demand. However, in the long term, there may need to be a new bridge crossing to keep pace with future demand.

Signage

- Develop and incorporate a system of wayfinding signs to efficiently guide traffic to businesses and destinations throughout the NRCC.
- Partner with the Missouri Department of Transportation and the City Streets Department to develop and implement ITS signage at strategic locations to alert drivers with a notification when at-grade crossings are blocked by trains.



Infrastructure

Stormwater

- The majority of the sewer lines within the NRCC have combined sanitary and stormwater lines. Within areas with combined sewer lines, the Plan recommends that a new sanitary sewer line be constructed reserving the existing line for stormwater. Although construction of new sanitary sewers are not an overall requirement, they are necessary to limit future combined sewer overflow discharges. Some of this construction will occur with new development and redevelopment. However, it is recommended that the NRCC business community proactively partner with the Metropolitan Sewer District (MSD), the City and others to fund larger-scale sewer separation projects.

Sanitary and Storm Sewer

- The Plan provides a comprehensive stormwater management strategy for the NRCC that identifies opportunities for shared stormwater facilities. This will create win-win scenario: for developers and land owners by reducing the impact of meeting stormwater requirements; for the City of St. Louis, it will help encourage investment and redevelopment of underutilized parcels; for MSD, it will help solve the stormwater challenges associated with the NRCC watersheds. For environmental and recreational groups, it will have the potential to create accessible green space.

Land Use/Zoning

- Target incentives to new development, infill development and redevelopment projects that are consistent with the identified preferred uses in the Land Use Plan and/or that help meet stated Plan goals.
- Work with local property owners and businesses to voluntarily meet the intent of the Land Use Plan and associated Design Guidelines.
- Proactively acquire and clean up problem properties. Once development sites are acquired, rezone the property to conform with the Land Use Plan.

Aesthetic Enhancements

- Upgrade North Broadway Street through streetscape and landscape enhancements to serve as an amenity to businesses and visitors and to provide a positive first and last impression of the NRCC.
- Improve street and pedestrian lighting to provide a safe, inviting and attractive environment for motorists and pedestrians.

Recreation

- Continue to improve and fully leverage the value of existing assets such as the Riverfront Trail and the on-street Bike St. Louis network as key amenities for the area.

Sustainable Strategies

- Support habitat restoration efforts along the Mississippi River edge, particularly in the northern end of the NRCC.
- Expand and enhance the open space greenway system to serve as a resource to the NRCC and to provide improved connections to adjacent neighborhoods.

Plan Use

This Plan provides a blueprint for future development, physical enhancements, infrastructure investments, marketing and branding, business support as well as funding and financing strategies for identified improvements. As such, the Plan is intended to be a resource for shippers, land owners, project applicants and other parties concerning land planning and community development objectives within the NRCC. The Plan should be consulted by the Board of Aldermen, the Planning Commission and City staff when considering incentives for development proposals, updating land use regulations, working on intergovernmental issues, outlining work programs, preparing annual budgets, and reviewing progress toward meeting identified goals.

What You Can Do

Take an active role! Property owners, business owners, and stakeholders with a direct interest in the NRCC should lead the effort to implement the Plan's goals. The City and local agencies will be an active participant in this effort, but the process of successfully implementing this Plan depends upon private leadership. We need your help. Specifically, you can:

- Participate in a Plan implementation leadership group.
- Engage St. Louis Development Corporation (SLDC) early in the process when you consider investment and expansion opportunities.
- Advocate Plan recommendations to property owners, business owners, stakeholders, and leaders.
- Incorporate the Plan's identified enhancements, design guidelines, and sustainable strategies into future development projects, expansions and improvements.
- Use the Plan as a marketing tool for your business.
- Share any concerns that you have about the NRCC, and communicate regularly with SLDC officials.

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1. STRATEGIES AND RECOMMENDATIONS

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1. Strategies and Recommendations

Introduction

PLAN AREA

The *North Riverfront Commerce Corridor Land Use Plan* (Plan) will serve as the long-range plan for the North Riverfront Commerce Corridor (NRCC), a 3,000-acre multimodal logistics and business district located on the north end of downtown St. Louis. The NRCC limits are from Cass Avenue to Maline Creek, and Interstate 70 (I-70) and North Broadway Street to the Mississippi River. The NRCC includes the Municipal River Terminal (MRT), a 27 acre city-owned port facility. The MRT is the only publicly-owned port terminal on the Missouri side of the Mississippi River within the 70-mile Port of Metropolitan St. Louis (PMSL). The St. Louis Port Authority is modernizing and expanding the MRT's docks to increase the facility's capacity to move bulk commodities through the area.

PLAN PURPOSE

Building on the current strengths of existing anchor businesses such as St. Louis Produce Market, Procter & Gamble (P&G), Covidien, Dial, an expanded and improved MRT facility, access to six Class I railroads, convenient access to I-70, and access to the new Mississippi River Bridge, the NRCC is poised to become a premier business center and multi-modal shipping and distribution hub for the central region in the United States. The purpose of the Plan is to identify strategies and recommendations intended to spur sustainable economic growth and generate additional jobs by emphasizing emerging businesses and industries that support quality employment opportunities for the City of St. Louis and the surrounding region. The NRCC is a significant employment center with approximately 10,000 jobs. Through implementation of the Plan, the NRCC Market Analysis identifies the opportunity to generate an additional 1,200 to 2,500 jobs over 25 years.

PLAN USE

This Plan provides a blueprint for future development, physical enhancements, infrastructure investments, marketing and branding, business support as well as funding and financing strategies for identified improvements. As such, the Plan is intended to be a resource for shippers, land owners, project applicants and other parties concerning land planning and community development objectives within the NRCC. The Plan should be consulted by the Board of Aldermen, the Planning Commission and City staff when considering incentives for development proposals, updating land use regulations, working on intergovernmental issues, outlining work programs, preparing annual budgets, and reviewing progress toward meeting identified goals.

PLAN CHAMPION

To implement the Plan's recommendations, property owners, business owners and key stakeholders should take a direct role. Although the City will be an active participant in this effort, the process should be sustained by local leaders. To begin the implementation process, it is recommended that a Plan leadership group be formed. To date, the North Broadway Business Association (NBBA) serves in this role. However, the NBBA currently does not have the ability to raise significant funding for identified improvements. It is recommended that a future organization structure be considered that could leverage future funding, such as a Community Improvement District (CID). Organizational options and recommendations are provided in Chapter 2.

FUNDING AND FINANCING

In addition to a CID, there are a variety of funding and financing sources available to governmental agencies, local business owners and developers to meet the financial needs associated with the Plan recommendations. Chapter 3 provides a full description of the funding and financing options that are applicable to the NRCC. For each funding and financing option, the targeted use of the funds, the requirements necessary to obtain funding, and the application processes are explained.

INVENTORY AND ANALYSIS

As part of the Plan process, the project team conducted an inventory and analysis of existing conditions within the NRCC. This inventory and analysis included the following:

- Market Analysis and Economic Impact (Chapter 4)
  - NRCC Market Analysis
  - Analysis of Bulk, Liquid and Containerized Cargo
- Land Use and Infrastructure Analysis (Chapter 5)
  - Zoning/Permitting Analysis
  - Land Acquisition Options
  - Environmental Analysis
  - Utility Analysis
  - Circulation Analysis
  - Freight Analysis
  - Analysis of Regional Needs
  - Sustainable Design
  - MRT Conceptual Plan

The project team and City staff used this information to guide decision making through the Plan process. As a result of this analysis, key information was delineated on a series of maps that allowed the project team, City staff, stakeholders and the public to quickly and efficiently examine and synthesize key issues and opportunities for the NRCC.

PUBLIC ENGAGEMENT

This Plan's strategies and recommendations are a result of an inclusive public process that identified and addressed the NRCC's weaknesses, challenges, strengths and opportunities. The public process included extensive stakeholder outreach to the NRCC's property owners and business owners as well as public agencies. In addition, three public workshops were held throughout the Plan process. Each workshop was designed to promote an open dialogue between participants, the project team and City staff to maximize public input. A summary of the public engagement process is provided in Chapter 6.

Key Issues and Opportunities

Key issues and opportunities that guided the development of the Plan are as follows:

1. **PHYSICAL CONDITIONS**

   Issue: For a majority of the public, the primary perception of the NRCC is of vacant and underutilized properties, deteriorating infrastructure and dilapidated physical conditions observed from driving by or through the area along I-70 and/or North Broadway Street. Other perceptions are formed by pedestrians and cyclists using the Riverfront Trail.

   Opportunity: Aesthetic enhancements, infrastructure investments and redevelopment efforts should be targeted to improve the NRCC's edges, especially along the area's primary transportation corridors: I-70, North Broadway Street and the Mississippi River. Additionally, the NRCC business community and the City should continue to partner with Great Rivers Greenway (GRG), Trailnet, the Confluence Greenway, Grace Hill, the Missouri Department of Conservation (MDC) and the Missouri Department of Natural Resources (MDNR) to improve and fully leverage the value of the Riverfront Trail, the Trestle, the Branch Street trail and on-street Bike St. Louis network as key amenities for the area.

2. **TRANSPORTATION NETWORK**

   Issue: Despite its central location and excellent interstate, rail and river access, to date, the NRCC has attracted few true multi-modal businesses and uses.

   Opportunity: The St. Louis region is known as a shipping leader using various modes of transportation including rail, truck, water, and air freight. The NRCC is well-positioned to take advantage of the expanding shipping and distribution industry in the region due to the increased capacity of the MRT, improved regional mobility provided by the new Mississippi River Bridge, access to six Class 1 railroads and recent investments by a number of emerging businesses and industries. The Plan transportation network improvements are intended to allow shippers to expand existing operations and add/or add new operations that will significantly increase the quantity and diversity of products shipped through the area. Other opportunities include identifying sites with highway, rail and river access. Sites adjacent to or bisected by Terminal Railroad Association (TRRA) rail lines are ideal for businesses with the need for rail access. The TRRA provides access to all six Class I railroads. Sites with direct access to I-70 and the TRRA are ideal for value-added manufacturing.

3. **ENVIRONMENTAL CONDITIONS**

   Issue: The NRCC has traditionally been used for a wide range of moderate to heavy industrial uses. A number of development sites predate regulatory tools designed to mitigate significant environmental hazards that are a by-product of industrial and high-intensity commercial uses.

   Opportunity: Fully leverage the St. Louis Brownfields Program to clean up existing or future contaminated properties. Utilize City resources to pursue Environmental Protection Agency (EPA) cleanup grants based on the area's ability to create high quality jobs and increase the city's tax base.

4. **COMBINED SEWERS**

   Issue: A majority of the NRCC has combined sanitary sewer and stormwater lines. Current St. Louis Metropolitan Sewer District (MSD) policies consider separation for new development projects on a case-by-case basis. However, there are no overall requirements for sewer separation throughout the NRCC.

   Opportunity: Within areas served by combined sewers, develop active partnerships with local businesses, stakeholders, MSD, and the City to proactively construct new sanitary sewer lines to significantly reduce future discharges during major wet weather events and to continue to upgrade the NRCC's infrastructure to meet future needs. Funding for these improvements could occur collectively through a CID or other similar funding mechanism.

5. **STORMWATER CONDITIONS**

   Issue: Due to old, inadequate or in some areas a complete lack of stormwater infrastructure, localized flooding, especially along Hall Street, continues to be a significant issue for businesses and property owners.

   Opportunity: Develop a comprehensive stormwater management strategy for the NRCC that identifies opportunities for shared stormwater facilities. This would create win-win scenario: for developers and land owners, it would lessen the impact of meeting stormwater requirements; for the City of St. Louis, it would help encourage investment and redevelopment of underutilized parcels; for MSD, it would help solve the stormwater challenges associated with the NRCC watersheds. For environmental and recreational groups, it would have the potential to create accessible green space and opportunities for habitat restoration.

6. UNRESTRICTED ZONING

Issue: A majority of the NRCC is currently zoned "K Unrestricted," which allows for a wide range of industrial uses. In, 2007 the *North Broadway Vicinity Commercial Areas Special Use District* (*Special Use District*) was adopted to address compatibility issues with salvage and junk yard operations, major scrap metal processors and vehicular-related businesses. According to stakeholder interviews, despite its intent, the *Special Use District* has not addressed all compatibility issues such as air quality due to dust and scrap debris littering surrounding areas. According to other stakeholders, the provisions of the *Special Use District* are not being fully enforced by the City. Conversely, provisions of the *Special Use District* restrict uses that are vital to an emerging warehouse and freight hub including vehicle service centers, vehicle repair facilities, etc.

Opportunity: Based on the NRCC Market Analysis, develop land use recommendations for preferred businesses to target for recruitment and/or retention. Develop design guidelines to address image and compatibility issues related to junk and scrap businesses that may have a negative impact on surrounding properties. Utilize the NBBA or other local organization to help businesses and operations self-enforce the *Special Use District* provisions and NRCC design guidelines. The City should also carefully review allowed and prohibited uses within the Special Use District to ensure that the allowed and prohibited uses are consistent with the NRCC Plan.

7. FUTURE LAND USE

Issue: The NRCC is comprised of a wide-rage of diverse land uses including industrial, warehouse, distribution, manufacturing, assembly, commercial businesses, recreational amenities and is bounded by a number of neighborhoods.

Opportunity: Develop a Land Use Plan that encourages a beneficial mix of uses to serve the NRCC and adjacent neighborhoods. The appropriate mix of uses will be defined based on the character and defined vision for individual Districts. See District Recommendations on pages 18-27.

8. LAND ASSEMBLY

Issue: Despite the volume of available property for sale, the scattered and fragmented land ownership patterns within the NRCC limit the ability for large users and industries in need of significant contiguous parcels for larger-scale development. The NRCC has to compete with suburban "shovel ready" sites on large parcels with one owner. For private developers, assembling land together one piece at a time can be very expensive, especially if there are significant environmental and infrastructure issues.

Opportunity: Develop a land assembly strategy, whereby NRCC businesses under a CID or other authority work proactively with the City to acquire and land bank strategic sites for future development. Development priorities for land assembly is based on the Land Development Analysis (See Chapter 5).

9. RECREATIONAL AND NATURAL AMENITIES

Issue: Address compatibility of development with existing and planned recreational amenities. The Mississippi River and Confluence Greenway are important regional assets for commercial interests as well as local residents, recreational trail users and riparian habitat.

Opportunity: Collaborate with established partners, supported by over two decades of public engagement, to promote compatibility of activities that will ensure user safety, habitat restoration, clean employee and tenant conditions and successful commercial operations. Leverage partnerships to promote the history and eco-tourism potential of the river. Connect adjacent neighborhoods to the Riverfront Trail and amenities.

10. MARKETING

Issue: Despite recent improvements and its significant assets, the NRCC lacks a strong vision and clear identity needed to compete with similar multi-modal sites and suburban "greenfield" development locally and nationally.

Opportunity: Based on the overall Plan vision, recommendations and strategies, develop a clear Branding and Marketing Plan for the NRCC with succinct messages targeted to key audiences including but not limited to developers, property brokers, existing businesses, third party logistics providers, manufacturers, public agencies, railroads, trucking companies and barge companies.

11. LOCAL CHAMPION

Issue: To date, the NRCC has benefited from significant support and investment through City, state and federal agencies. Examples of these investments include the recent improvements to the MRT and the new signature Mississippi River Bridge. However, these agencies have limited resources. To fully implement the Plan recommendations, the local business community within the NRCC will need to partner with public agencies.

Opportunity: Identify a single management entity within the NRCC, such as a CID that can directly represent local business interests in addressing current challenges and opportunities. A CID or similar organizational mechanism will provide the ability to generate additional revenue for infrastructure, safety and aesthetic improvements.

Alternatives

Preparing conceptual land use alternatives is an exercise designed to identify potential future outcomes. During a two-day design workshop, the project team developed two conceptual alternatives based on input received at Workshop #1, input from an extensive stakeholder engagement process and an analysis of existing conditions. These alternatives addressed land uses and development patterns, density distribution and policy implications. Key characteristics for each alternative are summarized on the following pages. These alternatives were blended and modified to create a preferred plan. The final preferred plan forms the basis for the NRCC Districts. More detailed site-specific conceptual alternatives were developed for the MRT. Descriptions of these alternatives and recommendations are provided in Chapter 5.

ALTERNATIVE 1: CAMPUS/NODAL FRAMEWORK

This alternative focuses redevelopment efforts within targeted nodes at major east-west intersections along I-70. This strategy is a blending of the campus framework recommended in the 2003 *North Riverfront Business Corridor Master Plan* and existing trends. Land assembly efforts, infrastructure improvements and amenities will be targeted in these areas. The balance of the NRCC will include basic maintenance of existing infrastructure and the predominate character of the area will remain industrial.

CAMPUSES/NODES

- Branch: Industrial mixed-use.
- Merchants: Manufacturing mixed-use.
- Carrie: Warehouse/distribution/highway commercial.
- Riverview: Unrestricted industrial.

CHARACTERISTICS

- Targeted development, infrastructure improvements and amenities at key nodes.
- Highway-focused warehouse/distribution.
- Balance of area remains industrial.

POSITIVES

- Prioritizes limited funding.
- Provides an identifiable address to aid in wayfinding.
- Recognizes existing range of industrial development.

NEGATIVES

- Does not fully leverage river and rail assets.
- Defined areas are not homogenous in terms of scale, character and infrastructure needs.
- Does not address compatibility concerns.

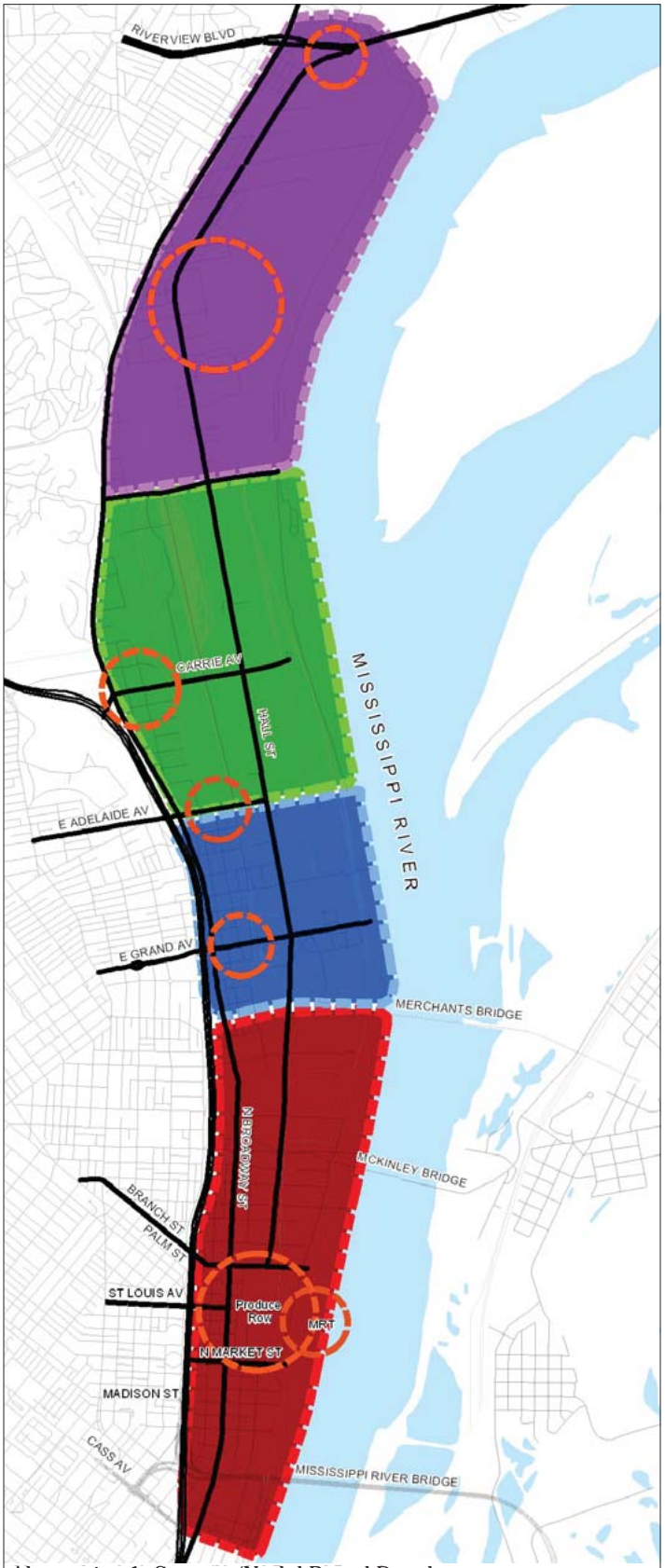


Figure 1.1 - Alternative 1: Campus/Nodal Based Development

ALTERNATIVE 2: CORRIDOR FRAMEWORK

This alternative recognizes the three defining features of the NRCC: the Mississippi River corridor, the North Broadway corridor and the Hall Street corridor. Each of these transportation corridors have influenced the area's land use patterns, urban character and infrastructure. Therefore, these corridors provide an ideal framework to organize areas with similar characteristics and infrastructure needs.

CORRIDORS

- Mississippi River Corridor: Complementary river-oriented development compatible with the MRT and the Confluence Greenway facilities.
- Broadway Corridor: Mixed-use, manufacturing, small-to-medium scale warehouse and distribution.
- Hall Street Corridor: Large-scale warehouse/distribution, highway-rail freight businesses.

CHARACTERISTICS

- Expanded MRT influence area through defined river-oriented development.
- Defines specific land uses for each corridor based on established anchors and existing infrastructure.
- Provides linkages to the extensive rail network.

POSITIVES

- Enhanced edges (Mississippi Riverfront and North Broadway) will provide a front door and positive impression of the NRCC.
- Corridor-based development allows for higher-level of refinement between land uses and logical transitions to address compatibility.
- Addresses transportation and circulation needs in a comprehensive way.

NEGATIVES

- The northern portion of the Mississippi Riverfront is difficult to navigate and is not as conducive to river-oriented development.
- The type of development is similar along corridors, however, there are differences in character and scale.
- Corridors are long geographic areas that may be difficult to prioritize infrastructure improvements.

PREFERRED ALTERNATIVE

The alternatives were presented to City staff to solicit feedback during a work session. Based upon this work session, Alternative 2 was selected as the Preferred Plan. Modifications and refinements to this alternative were made based upon extensive feedback from City staff, stakeholders and input from the public at Workshop #1 and #2. The Preferred Plan utilizes the Corridor framework to organize the NRCC.

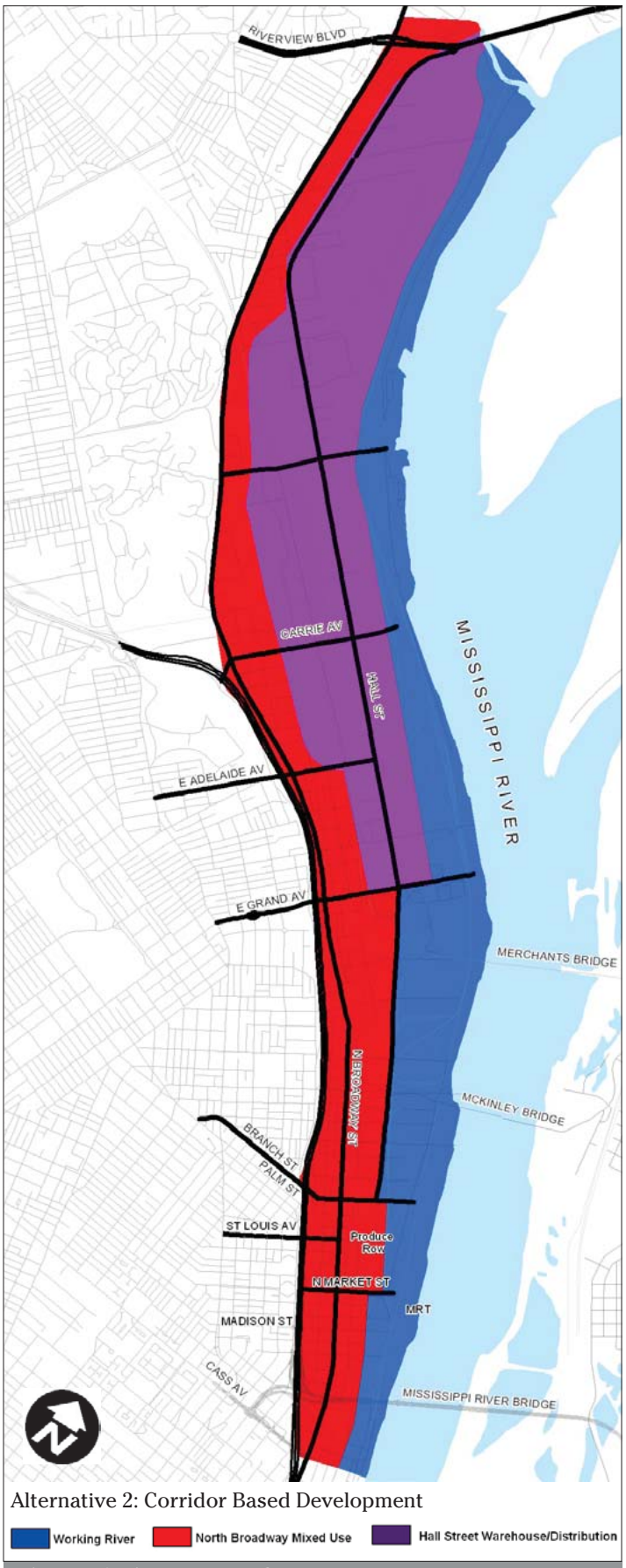


Figure 1.2 - Alternative 1: Corridor Based Development

Plan Organization

Plan Vision

Based on an analysis of existing conditions, input from City staff and the public at Workshop #1, the following vision was identified to guide the development of the Plan strategies and recommendations. The NRCC will:

- Attract high-quality jobs by targeting emerging industries and innovative businesses.
- Fully leverage its central location in the region and access to river, rail and highway infrastructure.
- Significantly increase the quantity and diversity of products shipped through the area.
- Provide quality services and unique amenities to remain competitive with emerging inter-modal hubs.
- Leverage the environmental, and recreational assets of the Confluence Greenway Mississippi River corridor to add value for area businesses, improve conditions for employees and provide compatible uses for recreational users.
- Be a sustainable business community through improvements and initiatives that demonstrate a commitment to the triple bottom line: the economic, environmental and social value they bring to the local area and St. Louis region.

Plan Framework

The three defining features of the NRCC are the Mississippi River, North Broadway Street and Hall Street. These corridors provide the framework for the Plan's strategies and recommendations. The key objectives associated with this framework are as follows:

- Enhance each corridor to improve the NRCC's image to provide a positive first and last impression.
- Fully leverage key transportation assets (river, road and rail) to transform the NRCC into a multi-modal hub.
- Target key industries and businesses based on existing and potential assets.

These corridors are divided into six Districts, (see *Figure 1.3*). These Districts were delineated based on variations in urban character, types of businesses and uses and infrastructure needs within each corridor.

- Mississippi River Corridor
  - Working Riverfront District
  - Natural Riverfront District
- North Broadway Corridor
  - Market District
  - Carrie District
  - Baden District
- Hall Corridor
  - Hall District

The Plan recommendations are organized as follows:

1. NRCC Recommendations: Provides "big picture" recommendations for the entire NRCC. Additionally, recommendations are provided for roadway and infrastructure improvements that cross multiple Districts (i.e., east-west roads and infrastructure).
2. District Recommendations: Provides more specific recommendations tailored for the needs of each District.

NRCC Recommendations

The NRCC Recommendations are divided into the following categories:

- Land Use Recommendations
- Signage Recommendations
- Freight Transportation Recommendations
- Infrastructure Recommendations
- Recreation and Sustainable Strategies

Land Use Recommendations

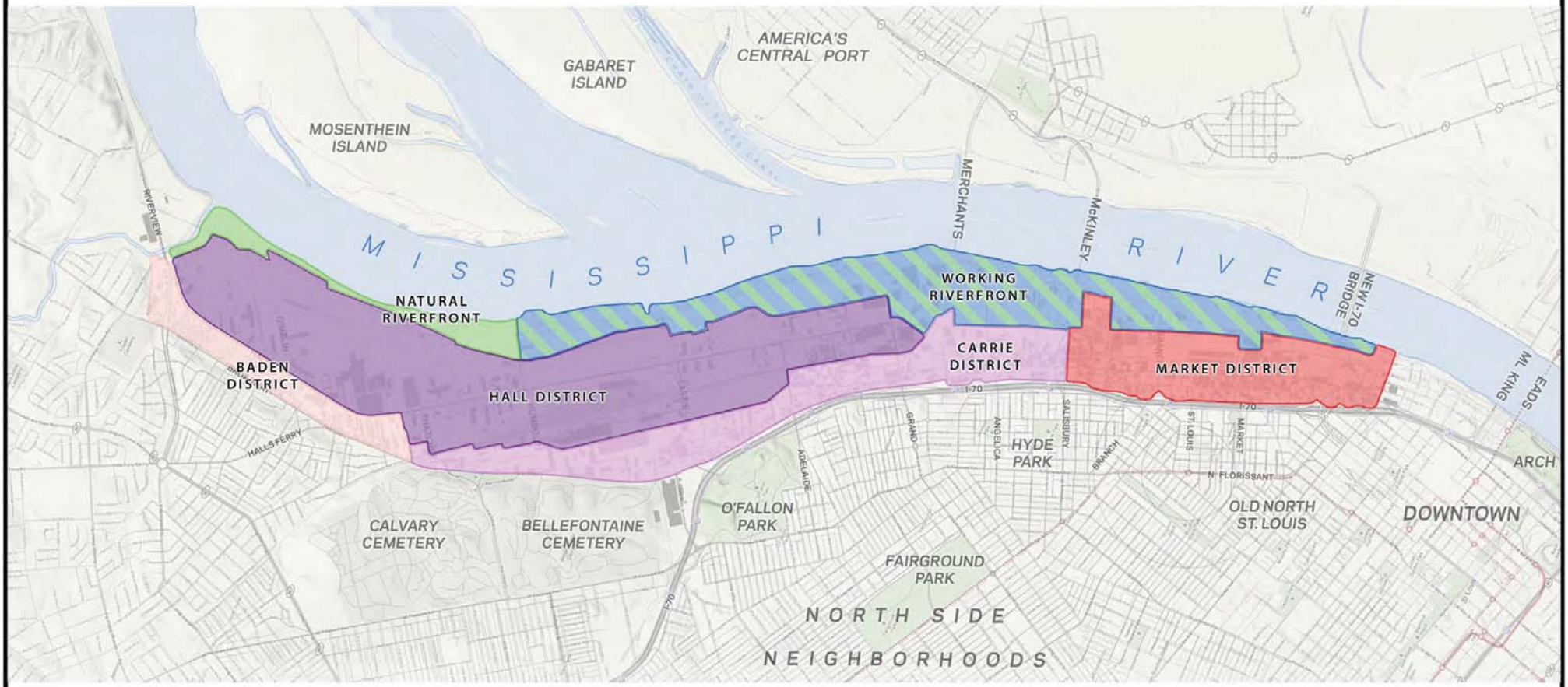
ADDRESS COMPATIBILITY ISSUES

To address compatibility issues associated with allowed and conditional uses under the "K" zoning within the NRCC, the Plan recommends a multi-phased strategy.

- *Ongoing:* Like most municipal departments, the City Building Division and problem properties department have finite resources. Therefore, the North Riverfront Business Association (NBBA) or other local entity is encouraged to proactively work with local businesses and operations to help self-enforce the *Special Use District* provisions and Plan design guidelines. Although local entities do not have the police power of the City, they do have the ability to engage in active dialogue with property owners.
- *Phase I (Short-Term):* Proactively acquire and clean up problem properties. The acquisition of land provides the most effective land use control. The City and County currently have two redevelopment authorities that can acquire sites: the Land Reutilization Authority (LRA) and the Land Clearance for Redevelopment Authority (LCRA). On the private side, the NBBA, under a CID or other authority, can use generated revenue to acquire and land bank sites for future development.
- *Phase II (Long-Term):* Once development sites are acquired and assembled by the City, the NRCC CID or other authority, rezone the property to conform with an approved development plan based on the specific land use recommendations within each District.

ATTRACT MULTI-MODAL BUSINESSES

A key objective of the Plan is to attract true multi-modal businesses to the NRCC. The NRCC provides access to an improved MRT and all six Class I railroads through the TRRA. The Carrie District provides excellent access to I-70 and the TRRA. The following recommendations and strategies are intended to attract multi-modal businesses to



LEGEND

NRCC Development Districts

- Working Riverfront
- Natural Riverfront
- Market District
- Baden District
- Hall District
- Carrie District

April 2012

NORTH RIVERFRONT COMMERCE CORRIDOR

NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG 1.3 DEVELOPMENT DISTRICTS

these areas:

- *Assemble Sites:* When determining priorities for land acquisition, the City should target properties with access to the TRRA. See Land Assembly Strategies for the Working Riverfront and Carrie Districts.
- *Upgrade Transportation Infrastructure:* Transportation improvements should be prioritized to improve mobility for freight within and through the NRCC. Access to I-70 and the MRT should be a priority.
- *Target Development Incentives to Attract Multi-Modal Businesses:* Development incentives should be prioritized to attract businesses who take advantage of at least two of the three major modes (river, rail and highway).
- *Tailor Marketing Strategy to Key Audiences:* The NRCC has significant locational advantages. Upon implementation of this Plan, the NRCC will also boast upgraded infrastructure and competitive amenities. These attributes should be highlighted and marketed to key multi-modal freight audiences.

Signage Recommendations

WAYFINDING SIGNAGE

Establish a system of wayfinding signs to efficiently guide traffic to businesses and destinations throughout the NRCC. The locations of these signs are shown in *Figure 1.5*.

- *Major Wayfinding Signs:* Are located at the key entrances into the NRCC including exits along I-70, North Broadway Street and Riverview Drive. These signs would include the following information
  1. NRCC Brand name and logo.
  2. Major Anchor Businesses: MRT, St. Louis Produce Market , etc.
  3. Attractions: Riverfront Trail, etc.
- *Minor Wayfinding Signs:* Are located at the major intersections of east-west streets (North Market Street, Branch Street, East Grand Avenue, Adelaide Avenue, and Carrie Avenue) and the major north-south streets (North Broadway Street and Hall Street). These signs could be banners or metal (as shown in *Figure 1.4*). These signs will include the following information:
  1. District/Corridor Name
  2. Business Names

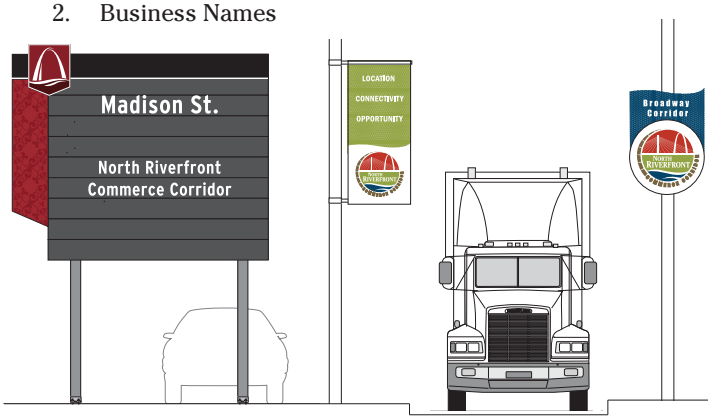


Figure 1.4 - NRCC Wayfiding Signage

Figure 1.5 - NRCC Wayfinding Signage Locations

BIKE/PEDESTRIAN SIGNAGE
Coordinate with Great Rivers Greenway for the integration of Bike St. Louis network and pedestrian signage within the NRCC to highlight designated bike routes and trails.

INTELLIGENT TRANSPORTATION SYSTEM (ITS) SIGNAGE
Partner with the Missouri Department of Transportation (MoDOT) and the City Streets Department to establish a system of dynamic message signs to alert drivers with a notification when at-grade crossings on the arterial network of streets are blocked by trains. The signs will allow drivers adequate time to make decisions on an alternative route. The dynamic message signs will be located along I-70 to provide information to drivers approaching the NRCC. Additional signs will be located along Hall Street for drivers leaving the NRCC. *Figure 1.6* provides an example of the ITS sign and *Figure 1.8* on the following page shows general locations where train presence must be detected and where signs can be deployed to inform drivers. The following roads have access to I-70 and will have at-grade crossings monitored:

- East Grand Avenue
- East Carrie Avenue

The proposed system would have the following components:

- Train Detection
- Dynamic Message signs
- Communications links

The system will be able to detect the presence of a train blocking street crossings. There are various technologies to be considered that include the traditional track-circuit, microwave radar, video and infrared. A track-circuit detection approach would require significant involvement of the railroads that own the tracks. Other technologies can be implemented from outside of the railroad right-of-way. As part of the design process, the available technologies should be assessed based on functionality and cost. Informing drivers that an at-grade crossing is blocked while they are traveling can best be accomplished using dynamic message signs. A hybrid static/dynamic sign could be used to inform drivers that an at-grade crossing is blocked. As shown in *Figure 1.6*, the static portion of the sign would list the access routes and the dynamic portion could display a message reporting the at-grade crossing is blocked. The sign will need to be located upstream of the available routes and located to maintain appropriate spacing between roadside signs. The size of the sign will be larger with higher designated traffic speeds on a route, so signs along I-70 will be larger than signs along Hall Street.

A control application is needed to activate the dynamic messages when a train is detected blocking an at-grade crossing. The application could be implemented on a standalone computer housed in a roadside cabinet, on a computer in a NRCC operations center or be implemented as part of MoDOT's Gateway Guide advanced transportation management system.

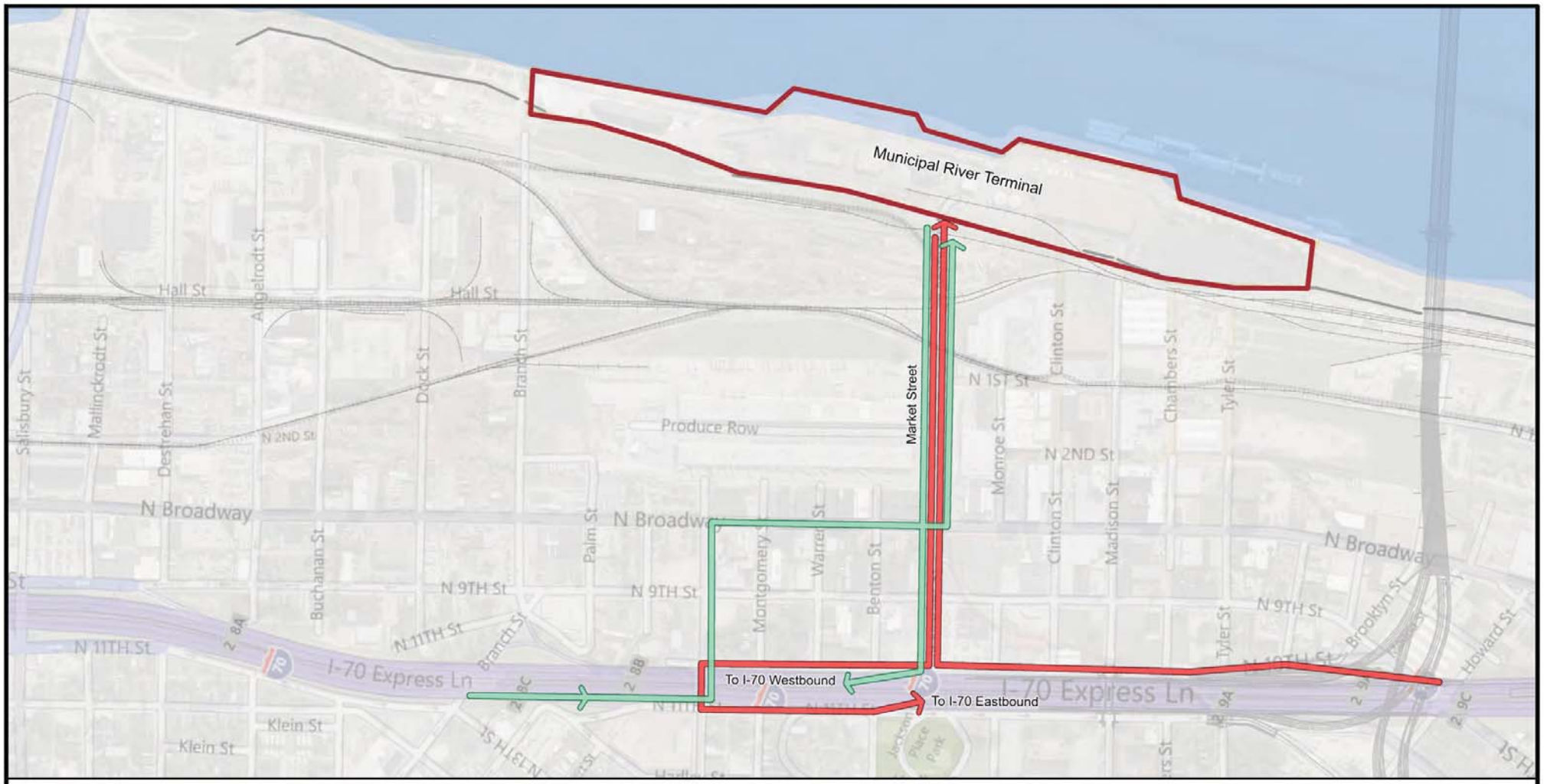
Communications links are required between the control application and the train detectors and the dynamic message signs. The amount of data being transmitted is limited, so wireless or fiber optic technologies can be used. If the train detection and traveler information system is integrated into the Gateway Guide system, each device would need to connect to the existing MoDOT network that runs along I-70. To refine the proposed train detection and traveler information system an Operations Plan should be developed along with an ITS project architecture. These plans and processes will be developed in conjunction with local stakeholders to meet the specific needs of the area and will be coordinated with other existing and planned ITS systems. Along with determining system functionality, it will be critical to determine who will operate and maintain the system.

Figure 1.6 - ITS Sign

Freight Transportation Recommendations

This section focuses on major truck freight access and circulation improvements to enhance the movement of goods within and through the NRCC. Multi-modal transportation improvements, including complete street recommendations for North Broadway Street and aesthetic enhancements to Hall Street are provided within the District Recommendations.

A Freight Analysis (see Chapter 5) examined freight operations and commodity flows for the NRCC and the St. Louis region. Freight studies have been on-going in the area for some time. Therefore, this assessment summarizes existing freight commodity flows examined in existing studies and summarizes freight stakeholder's viewpoints on freight strengths, weaknesses, opportunities and threats for the NRCC and region. Based on the analysis, a number of freight improvement goals were developed to address study area needs. To address the freight goals, short-term and long-term freight improvements are recommended to address freight movement within the NRCC. *Figure 1.7* illustrates the circuitous route that trucks and other vehicles currently travel to reach destinations like the MRT. Freight improvements are shown on *Figures 1.8* and *1.9*. NRCC freight improvements are based on interviews with



LEGEND

- Municipal River Terminal Area
- Access from I-70 West
- Access from I-70 East

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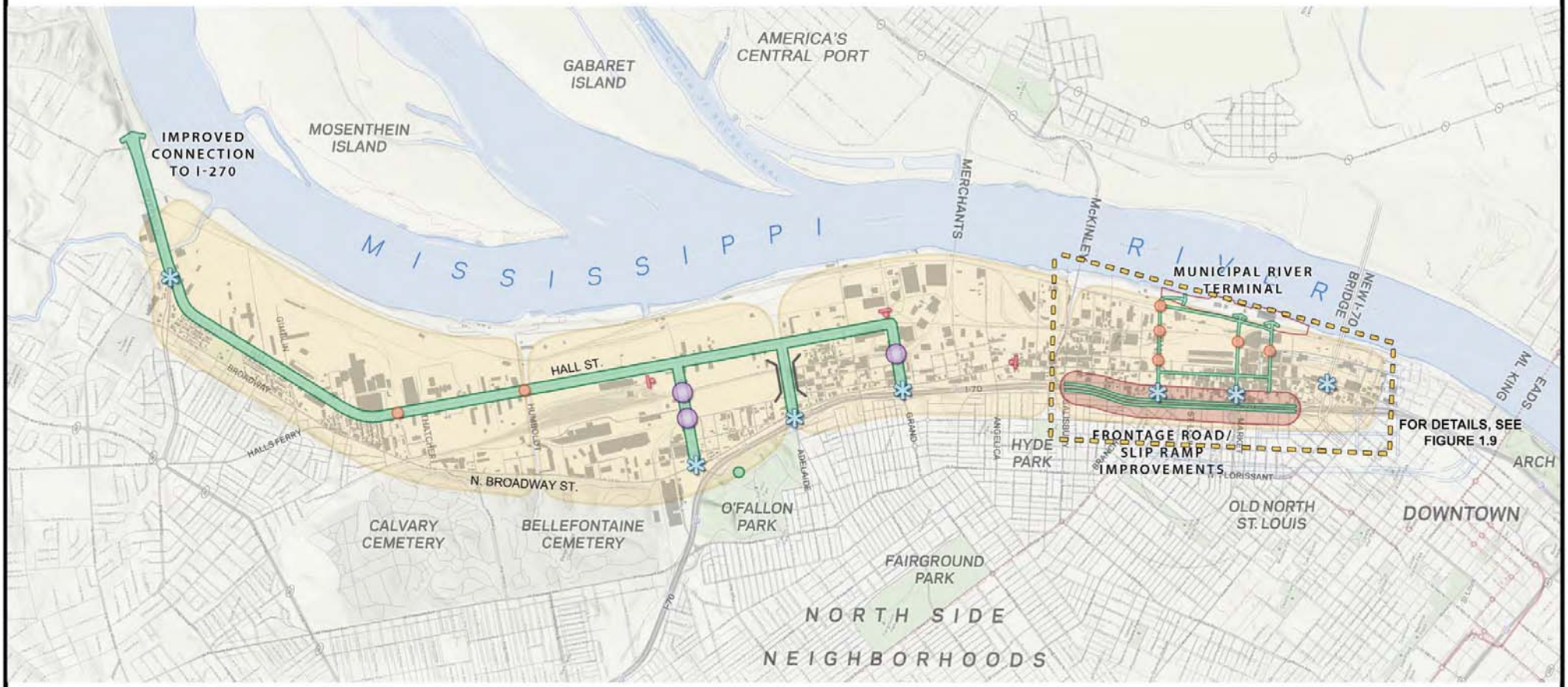
FIG.1.7 EXAMPLE OF EXISTING FREIGHT ACCESS ROUTES



LEGEND

- Designated Freight Road Corridor
- Future Rail Grade Separated Crossing / Interim Train Detection
- Primary Access / Wayfinding
- Interim Dynamic Message Sign
- Existing Grade Separated Crossing
- At-Grade Intersection Improvements

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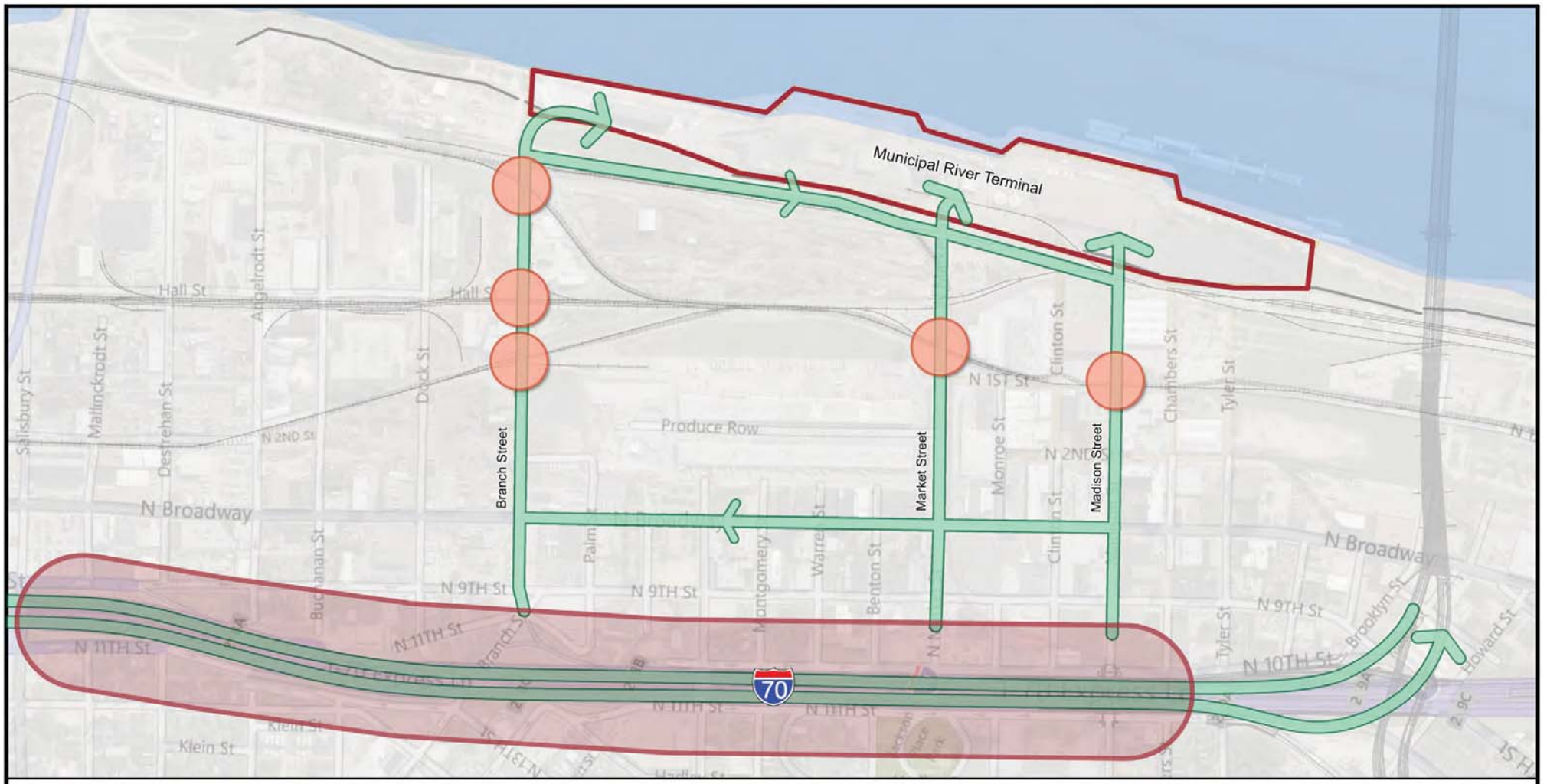
FIG. 1.8 FREIGHT IMPROVEMENTS



LEGEND

- Municipal River Terminal Area
- Designated Freight Road Corridor
- Slip Ramp Access Improvement Zone
- At-Grade Intersection Improvements (Long Term)

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FIG. 1.9 FREIGHT IMPROVEMENT INSET

stakeholders, previous freight studies, and regional freight goals identified in East-West Gateway's Regional Transportation Plan, *Legacy 2035*.

- Improve access to the MRT and other NRCC land uses
- Address North Market Street congestion
- Improve access to the Mississippi River Bridge
- Improve circulation
- Improve safety

SHORT-TERM FREIGHT IMPROVEMENTS

These improvements can be implemented within a three to five year time period and will have a positive impact on freight movements within the NRCC.

Improve the I-70 Slip Ramp System

Access from I-70 to the southern portion of the NRCC is provided through a series of closely spaced slip ramps. The multiple slip ramps create an abundance of access to and from I-70, however, the access also necessitates a number of on and off-ramps that can add turbulence to the I-70 traffic flow. Additional access points also create additional opportunities for safety problems. It is recommended that these ramps be improved and potentially reconfigured to channel traffic more efficiently to designated east-west Freight Corridors including Tyler Street, North Market Street and Branch Street. Improvements to Branch Street need to be coordinated with Great Rivers Greenway to evaluate viable recommendations that account for integration of a future bike/pedestrian trail. In addition to traffic operations, engineering design of the slip ramps should be evaluated as to spacing, grade, and deceleration and acceleration lengths. A more detailed study should be performed to analyze the traffic operations along I-70 and evaluate the current slip ramp design to ensure that current standards are met. Any consideration of improvements along I-70 will need to be studied through a systems analysis review, Access Justification Request (AJR) and an environmental review process.

Rehabilitate Merchants Bridge

Merchants Bridge, built in the 1889, is functionally deficient and needs $150 million in repairs. Presently, the bridge can only accommodate one train at a time, for a total of about 25 trains per day. Amtrak trains can only travel at very slow speeds. In the short-term, Merchants Bridge will need to be rehabilitated to keep pace with current demand. To date, the TRRA and MoDOT have acquired $13.5 million for improvements.

LONG-TERM FREIGHT IMPROVEMENTS

These improvements could be completed within a five to 20 year time period and would have a positive impact on freight movements within the NRCC.

Study Feasibility of Future River Bridge Rail Crossing

Currently, there are two rail bridges that cross the Mississippi River: the MacArthur Bridge and the Merchants Bridge. According to TRRA, the current owner and operator of both bridges, the MacArthur Bridge is at 80 to 90 percent capacity and Merchants Bridge is in need of significant repair. Repair of Merchants Bridge will meet current demand. However, in the long term, there may need to be a new bridge crossing to keep pace with future demand.

Rail/Road Intersection Improvements

These areas are likely to remain at-grade crossings, however, intersection improvements including mitigating profile deficiencies, integrating ITS train detection system, upgrading active warning devices/signals and improving pedestrian crossing safety are recommended to improve operations and safety. Rail crossing improvements are needed at the following intersections:

- Hall Street
- Branch Street
- North Market Street
- Madison Street

Construct rail grade separated crossings at the following key high-traffic intersections to avoid bottlenecks and improve safety:

- East Carrie Avenue
- East Grand Avenue

Due to the numerous conflicts with rail crossings in the NRCC, future grade separation projects should be prioritized to key intersections. The proximity of the I-70 ramps to North Broadway Street and East Grand Avenue intersections creates a significant bottleneck. Due to the high costs of grade separation projects, ITS train detection signage is recommended as a short-term interim option.

Study Feasibility of Future I-70 Interchange

Although North Market Street is the main entrance to the MRT, access to the area comes from multiple connections. The reason for this is the lack of consolidated access through a full interchange at I-70 near the MRT. Currently, trucks can take a slip ramp at Madison, and exit at Branch Street or Salisbury Street. This lack of a designated freight route into the MRT creates more truck traffic on North Broadway Street and other local streets. During the study process, a potential interchange between Salisbury Street and Madison Street was considered. A new interchange and consolidated access along the existing frontage road system has the potential to significantly improve safety and mobility. However, any consideration of a change in access along I-70 will need to be studied through a systems analysis review, alternatives analysis, AJR and a significant environmental review process.

Improve Connection to I-270
Currently, Hall Street is recommended to be improved within the NRCC (See Hall Street District Infrastructure Recommendations). However, to take full advantage of the regional connections, improvements should be considered along Riverview Drive to the interchange at I-270.

Infrastructure Recommendations

Infrastructure improvements are identified for the NRCC. This section provides sewer separation and stormwater improvements. Other infrastructure improvements, including specific micro-scale stormwater strategies for North Broadway Street and stormwater improvements and enhancements for Hall Street are provided within the District Recommendations.

FLOODWALL IMPROVEMENTS

On August 1, 1993, the Mississippi River crested at 49.6 feet. If this had been two feet higher, the floodwall would have been overtopped causing significant damage to the NRCC. Furthermore, as the Federal Government is planning on new policies regarding Flood Protection Insurance, new policies could have implications for future development within the area. The NRCC business community, local stakeholders and the City should continue to proactively work with the U.S. Army Core of Engineers (USACE) to plan for future improvements and upgrades to the existing floodwall system.

SEPARATE COMBINED SEWER

The majority of the sewer lines within the NRCC have combined sanitary and stormwater lines. Within areas with combined sewer lines, it is recommended that a new sanitary sewer line be constructed reserving the existing line for stormwater. These existing stormwater lines will be improved and/or supplemented with a collective stormwater strategy discussed in the following section. Although construction of new sanitary sewers are not an overall requirement, they are necessary to limit future combined sewer overflow discharges. Therefore, within existing corridors with combined sanitary and stormwater lines, it is recommended that a separate sanitary sewer line be constructed. Some of this construction will occur with new development and redevelopment. However, it is recommended that the NRCC business community proactively partner with MSD, the City and others to fund larger-scale sewer separation projects.

IMPLEMENT A COLLECTIVE STORMWATER STRATEGY

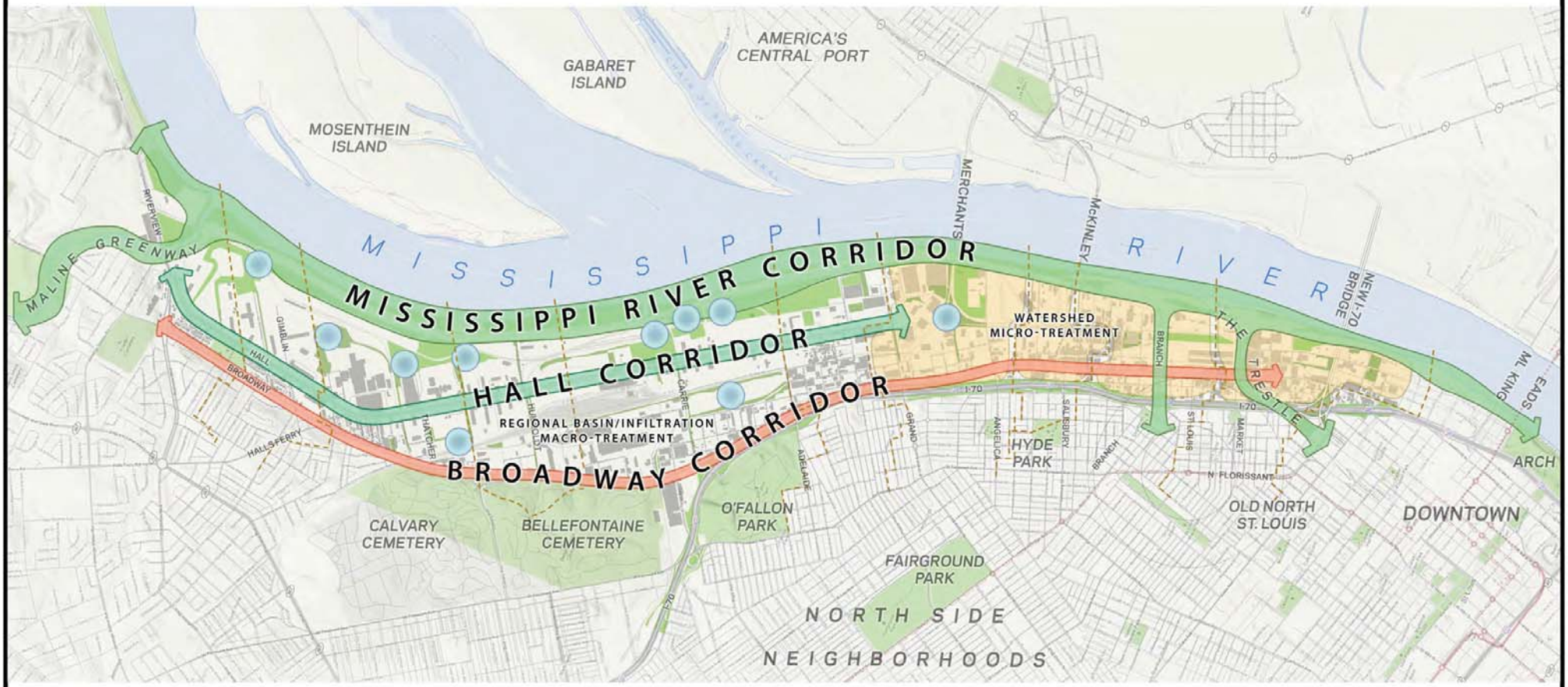
Implement a collective stormwater strategy to encourage investment and redevelopment of underutilized parcels, reduce runoff, improve water quality, and create shared green space. Individual site-specific "micro-scale" stormwater strategies are provided for each District. These site-specific stormwater strategies are intended to improve water quality within individual sites and address stormwater on a micro-level. Unfortunately, these site specific strategies, even undertaken in a coordinated and collective way, do not address larger stormwater volume issues within individual watersheds and throughout the NRCC. Therefore, these site-specific strategies need to be paired with a larger collective strategy within each watershed.

As part of the watershed management practice, areas throughout the NRCC will be designated as collective green spaces. This will be part of the low impact development (LID) strategy that will offer a range of solutions to reduce non-point source pollution and stormwater volume, reduce stormwater runoff velocity and maintenance costs, and improve landscaping around commercial and industrial buildings, parking lots and roads. This approach will be most effective in reducing flood damages from minor storms.

In accordance with 2011 MSD requirements, new development and redevelopment projects within the NRCC that disturb more than one acre may require permanent best management practice (BMP) facilities for stormwater quantity management. These facilities will be developed to meet basin volume and filter area requirements based on water quality volume (WQv) of 1.14 inches of rainfall per storm. As a rule of thumb, for every developed acre, four to five percent (1,742 to 2,178 square feet) must be set aside for a permanent best management practice (BMP) facility. According to this calculation, this suggests that of the 3,000 acres in the NRCC, approximately 120 to 150 acres should be set aside for a permanent BMP. These areas do not have to be a contiguous; however, areas should correlate with the different watersheds in the NRCC. Note, these requirements are subject to change in the future.

Figure 1.10, Opportunity Areas for BMPs, identifies potential locations for macro and micro-scale stormwater applications. These opportunity areas are divided into two categories:

- *Macro Treatments*: Existing development within these watersheds is characterized by larger parcels and open space/vacant areas with a disconnected street grid with limited existing stormwater infrastructure. To fill in the gaps of the existing stormwater infrastructure, the identified Greenway Linkages are intended to be acquired as a system to treat and convey stormwater. The costs for acquisition and maintenance of macro-scale BMPs should be shared collectively through public private partnerships between a CID or other authority and the City, MSD, GRG, Trailnet and other NRCC stakeholders. Recommended macro-treatment applications include:
  - *Regional Basin Opportunities*: Large footprint facility designed to treat and store a high volume of runoff from a broad area. Recommended stormwater applications within these areas include:
    - *Extended Detention*: A form of regional detention designed to store storm events for flood control and sediment/pollutant settlement and release over an extended period of time.



LEGEND

- Regional Basin Opportunities
- Greenway Linkages
- Watershed Boundaries

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FIG 1.10 OPPORTUNITY AREAS FOR BMPS

- *Natural Infiltration*: The most economical form of stormwater management, directing stormwater to landscape areas for percolation into the ground.

- *Micro-Scale Treatments:* Existing development within these watersheds is characterized by smaller parcels and a more defined street and stormwater infrastructure grid. Identified improvements within these areas are intended to address water runoff and quality for "typical" development sites in each District defined by the Mississippi River, Hall and North Broadway corridors. Developers and property owners will be responsible for installation and maintenance of micro-scale BMPs located on-site. Micro-scale BMPs within the public right-of-way should be a shared responsibility through a public private partnership. For specific improvements within these areas, see District Recommendations. Recommended micro-scale treatment applications include:
  - *Bioretention*: Collection of stormwater to a treatment area for purposes of absorption and filtration.
  - *Bioswale Infiltration*: A form of bioretention, designed for conveyance of stormwater as well as absorption and filtration.
  - *Infiltration Planter*: A form of bioretention, designed for sites with limited space. An example is landscape planters that allow temporary pooling of stormwater and release it over time by infiltration into the soil beneath.
  - *Rain Garden*: Landscaped depression that absorbs, filters, and releases rainwater.
  - *Stormwater Curb Extension*: Bump out of roadway curb as a traffic calming device that incorporates a stormwater treatment facility (bioswale, rain garden, pervious paving, etc).
  - *Pervious Paving*: Porous systems that permit water to percolate into the ground or in subbase storage for reuse or extended release.
  - *Green Roof*: Vegetation applied to a new or existing building roof for use in absorbing, filtering, and releasing rainwater.
  - *Rooftop Disconnection*: Re-direction of rooftop drain from gutter and downspout systems to an alternative treatment, generally either a landscaped area or cistern for storage and reuse.

The Greenway Linkages identified in *Figure 1.10* are intended to serve a functional purpose to treat and convey stormwater, however, an additional benefit is that these greenways can also serve as an aesthetic amenity for the NRCC through open green space, as a buffer between industrial development and as future trail connections.

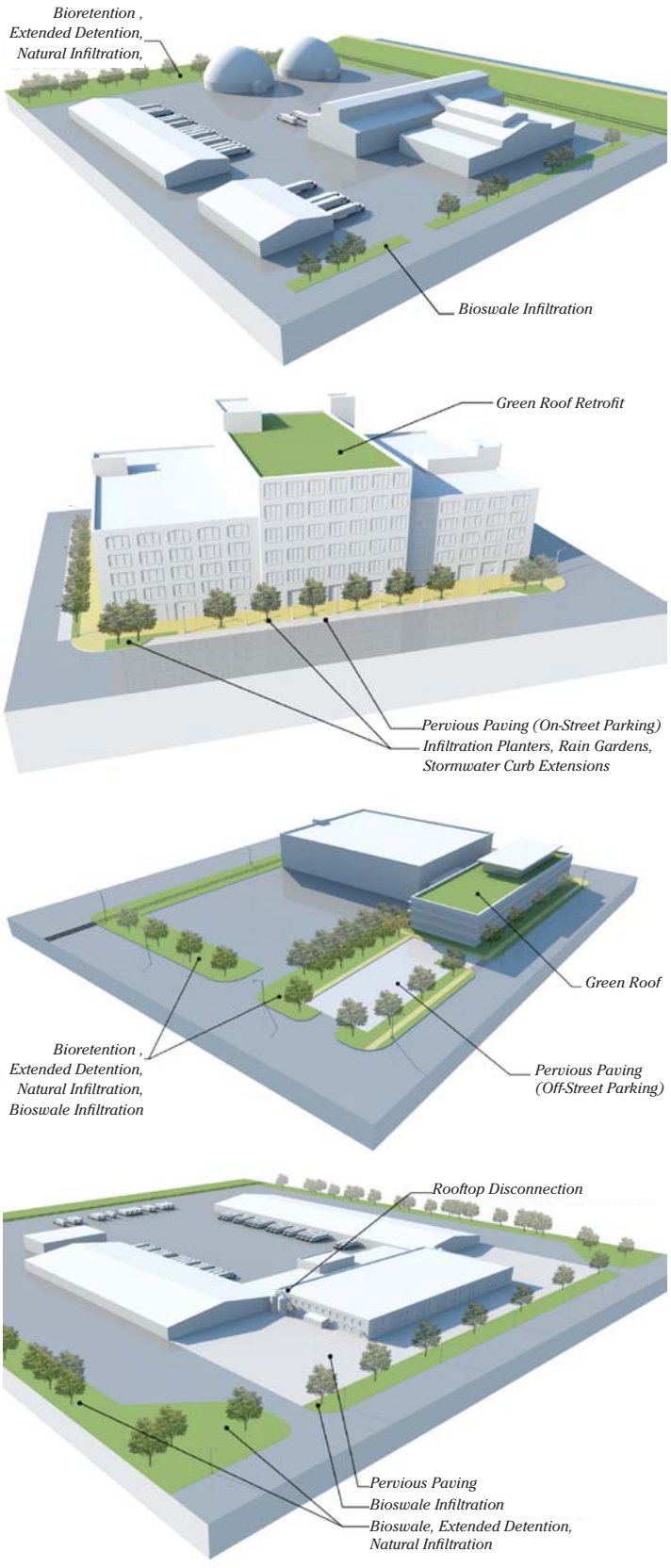


Figure 1.11 - Stormwater Micro-Treatment Examples

Recreation Recommendations

IMPLEMENT RECREATIONAL PLANS AND INITIATIVES

Recreational facility plans along the NRCC are numerous and enjoy popular support from the public as well as influential organizations. Bicycle, pedestrian and other park facilities benefit local businesses and nearby residents and, therefore, are consistent with the goals for expanding employment in the NRCC. Supporting the park, recreation and conservation efforts and initiatives of groups such as GRG, Confluence Greenway, Trailnet, Grace Hill, Mary Meachum Freedom Crossing, Bike St. Louis, the City of St. Louis Parks Department, MDNR and MDC will ultimately enhance the North Riverfront's environmental quality while providing a more dynamic, healthy and attractive place for business owners, employees, visitors and nearby residents.

In general terms, it is recommended that the NRCC commit to an overall strategy to support the following initiatives and projects:

- *Gateway Bike Plan: Regional Routes to Sustainability*
- *Bike St. Louis*
- *Riverfront Trail*
- *Confluence Greenway Branch Street Connection*
- *Mounds Heritage Trail*
- *Mary Meachum Freedom Crossing*
- *Confluence Greenway*
- *Maline Greenway*
- *McKinley Bridge and Branch Street Trestle*
- *Mississippi River Trail and Millennium Trail*
- *The Trestle (Iron Horse)*

ASSIST WITH THE IMPLEMENTATION OF THE BRANCH STREET PROJECT

One project, however, must be addressed in more specific terms due to its high value as both a recreational and commercial corridor: Branch Street from Old North St. Louis to the Mississippi River. For years, local businesses and advocates for recreational uses have offered plans and potential solutions to accommodate existing conflicting—and incompatible—activities.

Due to the fact that this corridor is the only direct connection between North St. Louis neighborhoods and the Mississippi River (in fact, one of the only connections in the entire city) commercial traffic and recreational uses value Branch as a very high priority for continued access. Most past proposals either required one of these two constituencies to forfeit access or simply did not adequately solve the problem of a shared use corridor. Neither of these categories of solutions should be considered viable.

Instead, the NRCC should endorse and actively support the latest initiative that would acquire additional right-of-way in order to provide fully separated commercial and recreational routes. This mutually beneficial proposal would likely require significant resources for property acquisition as well as construction. By increasing the magnitude of the project, it could potentially become a higher regional priority for funding.

IMPLEMENT A GREENWAY NETWORK

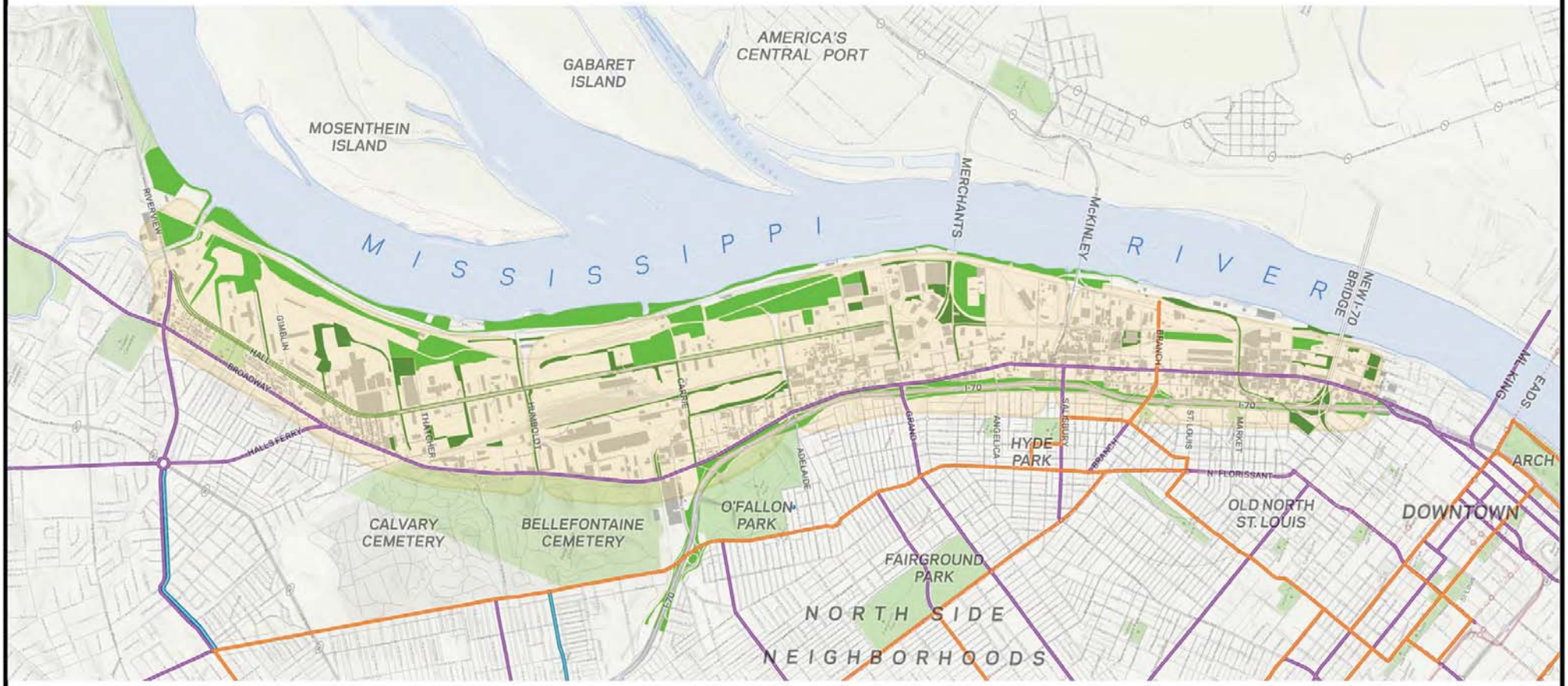
The Greenway Framework Plan, see *Figure 1.12*, identifies existing and potential open/green space within and adjacent to the NRCC. These open/green areas represent ecological as well as aesthetic resources that provide real benefits to the NRCC. The emphasis on sustainable development as a 21st Century focus for the NRCC is built upon some existing assets and precedents. Green corridors presently border the NRCC on both the east and west edges. The river's edge and bikeway greenway provide a green belt along most of the east edge and the Highway I-70 green right-of-way edge provides an almost continuous green band on the west edge. These green edges set the character for the concept of a green and sustainable NRCC.

The existing site screening/buffer, habitat restoration plantings and bikeway green corridor provide the framework upon which to expand habitat restoration and include stormwater measures to provide water infiltration, runoff control and filtering services. Corridor wide, water shed based sustainable practices reflect the overall commitment and aspirations of the Plan. The green swaths within the NRCC can complement the multi-modes of transportation and circulation through the area and help better define traffic flows and movement.

I-70 and North Broadway Street define the NRCC's west edge and provide a green edge in the planted right-of-way of I-70 and the wooded cemetery grounds along the west side of the north portions of North Broadway Street. These adjacent green swaths that frame and soften the NRCC's edge set a precedent that can be extended eastward into the area as street tree, median and stormwater plantings.

The Hall Street Corridor provides potential and challenges as a highly traveled, major road and utility corridor. The heavy volume of truck traffic along Hall Street contributes the environmental challenges of noise, congestion, air pollution and wear to the functional concerns of the corridor. The existing precedents within businesses that have provided perimeter and buffer plantings along Hall Street illustrate the potential character of the Hall Street corridor within the area. These examples set the stage for private and public efforts along the Hall Street right-of-way to provide green space improvements that also offer improved pedestrian, stormwater and environmental qualities of the NRCC.

The new Mississippi River Bridge and I-70 interchanges will provide improved highway access and visibility to the entire NRCC. Green space improvements along the new bridge and interchanges can significantly improve the



LEGEND

- Existing Greenway Resources
- Proposed Greenway Resources
- Existing Bike St. Louis Routes
- Proposed Bike St. Louis Routes
- Proposed Gateway Bike Plan Routes

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FIG 1.12 GREENWAY FRAMEWORK

physical and aesthetic quality of the entry experience to the NRCC overall and specifically to the Market District. The general categories of open/green space are discussed on the following pages:

The 2009 *Riverfront Habitat Restoration Master Plan (Habitat Restoration Plan)* prepared by and for The Confluence Project states that: "First and foremost, the riverfront is once again becoming an important recreational destination for regional residents and visitors. Areas of habitat restoration can provide this enhanced visitor opportunity. Second, areas of restored habitat provide improvements to the environment. Scientific evidence clearly indicates that native plant materials filter the air and water improving the quality of air we breathe and water we drink. Third, even within the limited "natural" areas found along the riverfront are many types of wildlife. Habitat restoration will provide enhanced habitat for this existing wildlife as well as attract additional species. Finally, all of the reasons given above provide additional educational opportunities not only for area children but adults as well."

"The resultant habitat restoration plan includes both public and private land within the project area. The private lands included in the plan are those that are currently undeveloped and present an opportunity for providing habitat until such time in the future as economic conditions make them desirable for development. It is important to emphasize that this plan does not suggest, in any way, that these private lands should be or are being considered for acquisition to enhance the habitat conditions of the Riverfront Trail. Instead this plan should be interpreted as an opportunity for landowners, non-profits involved with the riverfront corridor, and public agencies to partner in the improvement of the current environmental conditions of the riverfront until such time as the private land may be developed."

Key objectives:

- Contribute to stormwater management.
- Improve air and water quality.
- Maintain and restore habitat.
- Provide erosion protection cover and restoration of disturbed soils.
- Minimize environmental 'footprint'/impact of site development by maintaining and restoring existing site vegetation and soil resource.
- Provide aesthetic and visual buffer/screen between industrial yards/businesses and the river/trails/roadway/adjacent properties of the District.
- Illustrate the commitment to sustainable development through benign/conscious development practices.

The *Habitat Restoration Plan* identified a framework of existing sites to be maintained and/or restored to different vegetation types based on the existing topography, soil type, flood levels and desired character. The emphasis of the plan is on the restoration of native vegetation. A 'natural' succession has occurred on several sites which includes 'volunteer' re-vegetation of both native and non-native species. As an urban/industrial area, the successional re-vegetation of neglected, abandoned or reserved portions of sites should be embraced and encouraged. Planned and public restoration plantings should follow the native plant and ecosystem goals of the plan.

Park Land

- *Existing:* This includes all existing public park lands within and immediately surrounding the NRCC.
- *Proposed:* The map shows the proposed Trestle Multi-Use Trail and the associated park at the southwest end of the trail.

Habitat Restoration

- *Existing:* These areas are consistent the *Habitat Restoration Plan* (with the exception of the areas that have been developed since 2009) and include the existing river's edge vegetation stands that provide important bank protection and frame the view of the river.
- *Proposed:* Existing private property and utility right-of-way green belts and buffers identified in the spirit of the *Habitat Restoration Master Plan*, into an area-wide habitat restoration/open space system. These areas are also ideal locations for proposed stormwater BMPs. Improvements to these areas for restoration and or stormwater management should occur through public-private partnerships.

Highway Right-of-Way Planting

- *Existing:* This includes the existed planted/green highway right-of-way areas bounding the I-70 corridor at the west edge of the NRCC.
- *Proposed:* This shows assumed highway right-of-way areas associated with the new Mississippi River Bridge and interchanges connecting to I-70.

Cemetery Grounds

This includes the existing cemeteries adjacent to or near the NRCC. Bellefontaine and Calvary Cemeteries (along with O'Fallon Park) form a large, almost continuous band of green open space at the northwest edge of the NRCC. Currently, the cemeteries perform as vital urban habitat areas. Open space corridors established between the cemeteries and the Mississippi River will contribute greatly to their ecological value.

Bike Routes

The Greenway shows all bike paths, trails and designated routes per the latest *Gateway Bike Plan: Regional Routes to Sustainability and Confluence Greenway Master Plan (Gate-*

way Bike Plan). The Riverfront Trail has associated green open space along much of its length within the NRCC (particularly the northern portion) that is not included within the *Habitat Restoration Plan* but contributes to the overall green space of the NRCC. The bike paths and routes shown connecting to adjacent areas of the city provide the basis for planning the extension, expansion and connection of the bike system to better connect the NRCC to the greater city area.

Sustainable Design Strategies

Implementing ambitious strategies for sustainable design has the potential to distinguish the NRCC as a progressive, modern multi-modal transportation center. Sustainability has many definitions and categories. Understandably, different audiences, user groups and authorities have distinct missions and approach the concept of sustainable design through their own unique context. Developing an orderly and feasible set of strategies for the vast and complex NRCC, therefore, requires consensus upon a definition for sustainability, as well as useful parameters that address the relative scale of context.

Investigating best practices and case studies for district-oriented sustainable design (see Chapter 5) identified a number of sustainable organizational frameworks for developing a comprehensive set of goals and strategies. These systems (from USGBC, ASLA, Green Guide, ICLEI and Natural Step) are individually appropriate for developing recommendations at different scales and for different participating organizations. The following recommended strategies build upon these sustainable design frameworks.

It is helpful to consider the recommended sustainable design strategies for the NRCC within two scales of context:

- The overall NRCC; and
- Districts and individual sites.

For each of these contexts, sustainable design strategies are recommended for the following categories:

- Energy
- Transportation
- Materials
- Water
- Ecology
- Pollution
- Community

NRCC SUSTAINABLE STRATEGIES

At a NRCC-wide context, strategies are oriented toward long-term goals, transforming the overall social, environmental and economic health of the NRCC toward a self-sustaining model. The NRCC has an opportunity to encourage sustainable programs and initiatives, potentially requiring a minimum level of commitment from each site owner or developer. Initially, commitment from influential stakeholders in the NRCC will provide necessary leadership to entice other organizations to participate.

- *Energy*: Develop a comprehensive strategy to reduce energy consumption and potentially generate renewable, clean energy within the NRCC to gradually reduce energy dependence on “the grid”.
- *Hydrokinetic Energy Generation*: Install river turbines along the unchannelized portion of the Mississippi River between the Chain of Rocks falls and the southern mouth of Chain of Rocks Canal.
- *Solar and Wind Energy Generation*: Provide technical support and incentives to encourage site owners to use solar and wind generation of energy. Develop clean energy infrastructure that makes distribution available and beneficial to owners and tenants throughout the NRCC.
- *Energy Efficiency*: Implement energy conservation and efficiency features that capitalize upon alternative energy sources and include fixtures for public realm lighting and signage on a District basis.
- *Transportation*: Reposition the NRCC as a large scale transit-oriented development (in addition to multi-modal distribution) for the movement of employees, visitors and residents.
- *Existing Public Transit Service*: Several bus lines serve the NRCC, with the Metro 40 line running the full north-south length. Provide good internal connections to the bus transfer stations at Riverview Drive/Hall Street and at Carrie Avenue/North Broadway Street. The NRCC can coordinate with Metro to provide shuttle or route re-alignments to cover one-quarter-mile (five-minute walk) access to sites along the Hall Street corridor.
- *Transit-Oriented Development (TOD)*: There is an existing MetroLink station south of the NRCC at Eads/Arch Grounds, too far for pedestrian service to the NRCC but accessible for bus and shuttle transfers. Support the proposed North Side MetroLink extension which includes a station at St. Louis Avenue and North Florissant Avenue.
- *Regional Highway Access*: Improve Interstate highway accessibility and river access provided by favorable location and support NRCC efforts to coordinate, provide and maintain river and highway entry/exit ramps and dock facilities.
- *Local Distribution and Access*: Support efforts to provide local distribution for Midwest customers by promoting local and regional supply and production (within 500 mile radius) through rail, river and highway/street systems.

NRCC SUSTAINABLE STRATEGIES (CONTINUED)

- *Improved Accessibility*: Improve east-west alignment of parallel transportation routes: rail, trucking (highway/roads), barge (river), pedestrian (sidewalks, Riverfront Trail), bicycle (Riverfront Trail), and mass transit (Metro Bus route).
- *Materials*: Reduce the amount of waste NRCC-wide while promoting the area as a regional leader in material reuse and recycling. Historically, the area has been home to large and small scale material salvage operations. With a portion of these activities likely to remain for the foreseeable future, capitalize upon their environmental benefits to the St. Louis region.
- *Material Salvage*: Support and encourage existing salvage businesses in the NRCC to handle local (and perhaps regional) waste stream and recycling of solid and organic waste to meet sustainable construction and operation goals for owners, tenants and developers.
- *LEED Certification*: Provide central operation for waste recycling and material reuse in order to provide LEED qualified services for businesses throughout the NRCC.
- *Low Impact Materials*: Repurpose materials within the NRCC and from external regional sources (such as construction and production waste materials) to provide new business opportunities to reuse or reclaim as sustainably sourced materials.
- *Water*: As MSD continues its efforts to identify EPA compliance opportunities and strategies for stormwater, the NRCC should be positioned to be a near term location for implementing best management practices. Solutions to handle stormwater capacity can be most efficiently and effectively addressed at a macro-scale to minimize individual property owner costs and promote shared benefits.
- *Stormwater Mitigation*: The Plan provides strategies for significant stormwater retention and detention capacity within shared open space and rights-of-way. Coordinate public realm and NRCC-wide stormwater goals to manage overall capacity and volume reduction.
- *Ecology and Habitat*: Efforts to restore habitat areas and improve ecological health along the Mississippi River have been underway for years, and have the potential to greatly improve environmental quality for area businesses. Riverfront ecological restoration is a high priority, particularly in the northern end of the NRCC, north of Merchant's Bridge. Open space preservation and enhancements throughout the NRCC should be considered related components of a larger ecological network.
- *Greenways*: Support expanding the open space system on a NRCC-wide level through public realm facilities and connection to bikeways and greenways. Incorporate opportunities to include or connect to private open space that can perform ecological functions related to the overall Mississippi riparian habitat.
- *Public Realm*: Address public realm landscape throughout the NRCC to support physical character and sustainable goals of the Plan.
- *Brownfield Remediation:* The NRCC has been developed for well over a century—and many of the uses occupying commercial and industrial operations have resulted in contaminated soil and ground water, in addition to obsolete, dilapidated and abandoned structures. Sustainable design strategies for the NRCC must recognize the significant differences between greenfield development and redevelopment of brownfield and greyfield sites. Promote remediation efforts to make NRCC sites available for redevelopment. Provide support and assistance redeveloping brownfield and other previously developed sites in the NRCC in lieu of greenfield sites elsewhere in the region.
- *Contaminated Materials*: Support remediation efforts through waste cycle management by providing waste handling as well as material recycling.
- *Community:* Outside perceptions of the NRCC often misinterpret the area as a single-category industrial port. In fact, it is a mixed-use area that provides a variety of retail, institutional and recreational services for nearby residential neighborhoods. The NRCC must be considered a vital mixed-use area that supports vibrant healthy adjacent neighborhoods as well as a daytime community of its own employees and visitors.
- *Neighborhood Linkages*: Provide strong connections to adjacent neighborhoods and encourage community resources. Coordinate and encourage expansion of existing mass transit and bikeway systems to provide alternative transportation linkages to local labor force to meet community sustainability and equity goals.
- *Regional Highway Access*: Improve interstate highway accessibility and river access provided by the NRCC's favorable location and support efforts to coordinate, provide and maintain river and highway entry/exit ramps and dock facilities.
- *Local Distribution and Access*: Support efforts to provide local distribution for Midwest customers by existing mass transit and bikeway systems to provide alternative transportation linkages to local labor force to meet community sustainability (equity, et al) goals.

DISTRICT AND SITE SUSTAINABLE STRATEGIES

These strategies are intended to provide a framework for the development of sustainable strategies and practices within each District and individual sites. For individual sites, there are many sustainable design strategy possibilities that meet a wide range of budget constraints and technical abilities. Individual strategies may be the easiest to implement in the short-term due to the fact that they require less coordination and formal partnerships. Individual strategies are typically necessary for facilities to obtain certification through sustainable rating systems such as LEED. Often these will yield the most benefits at the individual site level, but collectively can make a significant impact at District-scale when numerous property owners invest in the same strategies.

Property owners, business owners, stakeholders, the City, public agencies and interested citizens should use this framework to develop and refine strategies to distinguish themselves. As such, these, strategies are oriented toward mid-term goals, focusing on opportunities to team neighboring property owners and businesses together to collectively solve sustainable design goals through economies of scale. Organizing sustainable design strategies by District will also give stakeholders the flexibility to establish their own priorities and time-lines according to the shared needs and resources of their neighbors; each District can pursue a unique path toward sustainability.

- *Energy*: Support District-wide and site-specific sustainable energy strategies. Individual property based energy strategies usually will not provide the scale of generation necessary for excess capacity, but they can significantly reduce long-term costs. Conservation strategies can be very cost-effective for individual sites.
- *Renewable Energy*: Promote active and passive solar collectors, wind turbines, and geothermal devices to reduce external energy demand.
- *Conservation:* Promote building energy performance, use and sustainable operations goals to reduce energy consumption—even when energy generation strategies are not employed.
- *Transportation*: District areas have locational similarities and are positioned to share sustainable opportunities to provide transportation efficiencies and conveniences to their employees and visitors. Employees will often be the biggest benefactors when sustainable transportation strategies are adopted. Cost savings, energy reduction, improved health and better convenience are provided to employees who take advantage of alternative transportation options.
- *Public Transit and Shuttle Service*: Provide incentives to encourage individual transit use for commuting to and from work, as well as for trips during business hours. Significant participation by employees will reduce employers' burden to provide maximum parking space on high valued property. Provide shuttle links to Metro transit facilities and supporting retail and commercial nodes between Districts.
- *Alternative Transportation*: Provide electrical recharge stations and bicycle facilities to promote convenience for employees to change commuting behavior.
- *Car Sharing, Bike Sharing*: Provide energy efficient, hybrid or electric vehicles, or bicycles, for work related employee use during business hours to make alternative commuting options more convenient.
- *Materials*: Site construction and daily operations generate different loads and types of material waste. Strategies will vary for individual properties as to how best to reduce waste according to specific site conditions.
- *Recycling*: Promote strategies to implement site-based recycling.
- *Construction*: Manage construction waste providing LEED collection and recycling guidelines and strategies to reduce waste volumes, increase reuse and maximize recycling.
- *Water*: Many solutions to reduce stormwater runoff and minimize impact from flooding are costly to implement on an individual site basis. Typical strategies require more space than is available or practical in urban locations such as the NRCC. Small scale stormwater solutions provide benefits—to a point. After these systems reach capacity they typical offer minimal returns. Repeated over a larger enough area, however, they can collectively provide significant impacts.
- *Stormwater Management and Mitigation*: Coordinate District stormwater management solutions among property owners and businesses to share resources and provide combined environmental, landscape and site goals. Address on-site stormwater mitigation on a per site basis utilizing identified micro-scale treatments to reduce runoff from low to moderate precipitation events.
- *Watershed Retention and Detention*: Devise a watershed approach for stormwater management. Identify opportunities for shared open space for runoff retention and detention facilities.
- *Grey Water Reuse*: Utilize larger capacity District storm facilities to harvest runoff for later re-use as irrigation or, in the case of certain NRCC facilities, re-use stormwater for dust control or rinsing commercial vehicles.
- *Ecology and Habitat*: Stormwater management strategies can be closely integrated with ecology and habitat strategies through design and co-location.
- *Native Landscape*: Incorporate appropriate native plant materials, designed with proper species mixes to reestablish indigenous habitat conditions, with stormwater detention and retention facilities. Seek other locations (with or without stormwater facilities) to replace manicured landscapes with native plant communities.
- *Urban Landscape*: Implement site specific landscape goals related to heat island, reduced (or eliminated) irrigation requirements and native plant associations to encourage naturalized micro-sites that function as components of a larger native ecosystem.

DISTRICT AND SITE SUSTAINABLE STRATEGIES (CONTINUED)

- *Brownfield Remediation*: Opportunities for brownfield remediation typically occur at the District level (through incentives) or at the site level targeting specific locations. Where possible, adjacent brownfield sites can be unified into larger redevelopment opportunities. Site-by-site, brownfields represent small but potentially very significant opportunities to restore elements of the urban environment. Cleaning contaminated soil and structures affects ground water and air quality while providing a healthier living medium for urban plants and wildlife.
- *Site Selection and Mitigation:* Support site selection goals that encourage brownfield remediation and land assembly for redevelopment opportunities.
- *Dock Facilities*: Identify strategies to share open dock facilities through coordination with selected site owners in order to optimize dock facility use in appropriate locations and reduce redundant or inefficient operations.
- *Materials*: Convenience and cost are important considerations for potential users to evaluate their ability to recycle or reuse commercial, non-hazardous materials. Sharing facilities, management and operational costs among multiple users may make such strategies feasible for smaller or infrequent participants.
- *Material Handling*: Recycling and resource re-purposing industries may align in specific Districts to serve the needs of a collective group of businesses where the scale and cost of such operations becomes infeasible for individual businesses to provide on-site.
- *Community*: Employment growth in the NRCC should benefit residents in North St. Louis neighborhoods. Safe and convenient access to these potential jobs, as well as a quality environment, are important to provide for the welfare of residents and workers. Support other sustainable strategies that encourage sense of community within individual Districts and throughput the NRCC.
- *Access:* Provide and encourage District linkages within the NRCC and to adjacent neighborhoods.
- *Environmental Quality*: Provide social and physical amenities to enhance Districts to reinforce their qualities as daily employment communities.
- *Wayfinding*: Provide coordinated, attractive and informative signage, environmental graphics and identification throughout each District to aid in wayfinding and identity through sense-of-place.

District Recommendations

The District recommendations are divided into the following categories:

- Vision
- Land Use
- Design Guidelines
- Transportation and Infrastructure
- Amenities
- Land Assembly

Vision: Articulates the preferred future for each District and sets the parameters for area-specific recommendations.

Land Use: Provides the preferred mix of businesses and uses for each District. Primary uses include preferred businesses and uses that should be targeted by the City to locate to the North Riverfront. Development incentives should be leveraged to attract these uses. Secondary uses are appropriate with certain conditions (as an ancillary use to a primary use as part of an overall development plan). Discouraged uses may be allowed under existing zoning, however, the City should carefully consider use of incentives for these uses.

Design Guidelines: Provides design guidelines intended to enhance the street edge within the Districts along the North Broadway Corridor.

Transportation and Infrastructure: Provides key transportation and infrastructure recommendations to improve circulation and mobility throughout the NRCC and within each District as well as needed improvements to major utilities to meet the needs of current and future businesses. These improvements include recommended micro-scale stormwater strategies intended to address water runoff and quality for "typical" development sites in each District.

Amenities: Provides recommendations for gateways, signage, design enhancements, streetscape treatments and lighting to reinforce and enhance each District's character.

Land Assembly: Provides specific land assembly strategies and priorities for each District. Big-picture land assembly strategies are provided in Chapter 5.

Working Riverfront District

VISION

- Maximize the MRT as a key commercial asset and greenway amenity for the NRCC and the St. Louis region.

LAND USE

- Primary Uses
  - Riverfront Trail and amenities;
  - Multi-modal businesses with a river focus;
  - Warehouse and distribution for bulk commodities; and
  - Outdoor storage for bulk commodities.
- Secondary Uses
  - Ancillary industrial and office flex for river businesses/operations.
- Discouraged Land Uses
  - Single-use retail and office uses; and
  - Residential uses.

TRANSPORTATION AND INFRASTRUCTURE

- Enhance the River's Edge: Maintain and restore vegetated river edge/bank to the greatest extent possible along the public/private margin between the river and rail corridor/bike path/flood walls. Provide aesthetic and visual buffer/screen between industrial development and the river.
- Re-open Madison Street to improve road connectivity and circulation to the MRT. The Madison gate will provide secondary access to the MRT and primary access for tall items through a removable lintel.
- Install wayfinding signage for the MRT and Working Riverfront businesses.
- Utilize green open space tracts for larger scale stormwater detention areas through the following applications:
  - Extended detention
  - Natural Infiltration
  - Bioretention
  - Bioswale infiltration

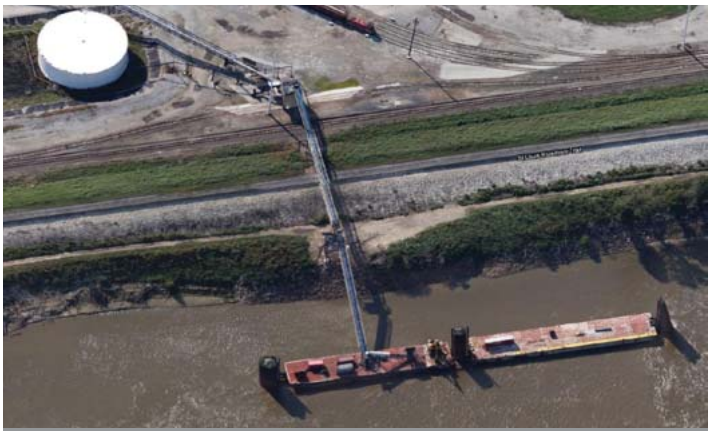

Figure 1.13 - Working Riverfront river's edge

Figure 1.14 - Working Riverfront precedent image

AMENITIES

- The 27-acre MRT, the only public, general purpose dock on the Missouri side of PMSL: New 2,000 linear foot dock; a 90,000 square foot south warehouse adjacent to the dock; and an active rail spur.
- Work with GRG, Trailnet, the Confluence Greenway, MDC and MDNR to continue to enhance the Riverfront Trail and designated "Greenway" area. Incorporate historical/ecological interpretive signage.

LAND ASSEMBLY

- Assemble sites suitable for businesses and operations that support the MRT and other river-oriented development.
- Utilize a CID, Port Improvement District (PID) or other local redevelopment authority to proactively acquire suitable sites. Priority will be given to:
  1. Expansion of the MRT and/or support industries, businesses or operations to the MRT;
  2. Parcels with access to levee gates and rail; and
  3. Expansion of existing river-oriented businesses.

Natural Riverfront District

VISION

- Restore and enhance the "natural" Mississippi River to provide an amenity and window to the area prior to urbanization and to model a healthy urban ecosystem.

LAND USE

- Primary Uses
  - Riverfront Trail and amenities;
  - Natural habitat restoration (in conjunction with the *Habitat Restoration Master Plan*);
  - Bird sanctuary; and
  - Stormwater detention area.
- Secondary Uses
  - Natural open space setback areas for adjacent development.
- Discouraged Uses
  - Any urbanized development with impervious surfaces.

KEY TRANSPORTATION AND INFRASTRUCTURE

- Enhance the River's edge through bank stabilization and erosion control. The Natural Riverfront's river edge is typically deeper than the Working Riverfront with adjacent restoration planting areas and greenway/trail extending the green swath width as the railway and industrial yards run farther to the west of the river.
- Utilize green open space tracts for larger scale stormwater detention areas through the following applications:
  - Natural infiltration
  - Limit impervious surfaces
  - Native vegetation cover

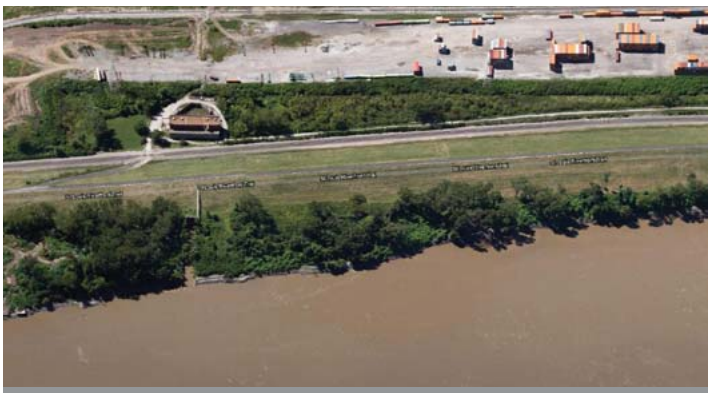

Figure 1.15 - Natural Riverfront river's edge

Figure 1.16 - Image of Natural Riverfront District

AMENITIES

- Restore the area's natural habitat through implementation of the *Habitat Restoration Plan.* This plan identified a framework of existing sites to be maintained and/or restored to different vegetation types based on the existing topography, soil type, flood levels and desired character. The emphasis of the plan is on the restoration of native vegetation. A 'natural' succession has occurred on several sites which includes 'volunteer' re-vegetation of both native and non-native species. Planned and public restoration plantings should follow the native plant and ecosystem goals of the plan.
- Work with GRG, Trailnet, the Confluence Greenway, MDC and MDNR to continue to enhance the Riverfront Trail and designated "Greenway" area. Incorporate ecological interpretive signage.

LAND ASSEMBLY

- Work with local partners including but not limited to GRG, Trailnet, the Confluence Greenway, MDC and MDNR to acquire land for habitat restoration, trails and preservation of open space.
- Work with landowners and developers to find suitable parcels in the Working Riverfront District for river-oriented development and operations.

Market District

VISION

- Accommodate a wide-variety of mixed-use businesses to provide goods and services to the NRCC and surrounding areas.

LAND USE

- Primary Uses
  - Wholesale food distribution and sales;
  - Business incubator space (all examples apply); and
  - Medium-scale retail/services. Examples include:
    - restaurant;
    - art gallery;
    - commercial bakery;
    - commercial nursery; and
    - industrial laundry services.
  - Small-scale manufacturing, processing and assembly with ancillary retail: Examples include:
    - bakery/candy/confectionery;
    - wood working/cabinetry;
    - fabrication/welding/machine shops;
    - appliance repair; and
    - electronics repair.
- Secondary Uses
  - Upper floor live/work residential.
- Discouraged Uses
  - Outdoor salvage yard and scrap operations; and
  - Outdoor storage of equipment and materials.

DEVELOPMENT GUIDELINES

- Where practical, buildings should front North Broadway Street. For new development, redevelopment and infill development, surface parking should be located at the inner block, behind or beside adjacent buildings.
- Where parking areas front North Broadway Street, the parking lot should be screened with a low decorative wall and/or landscape.
- Outdoor storage is prohibited on parcels fronting North Broadway Street.

TRANSPORTATION AND INFRASTRUCTURE

- Promote a complete street approach along North Broadway Street by accommodating vehicles, pedestrians and bicycles through implementation of the Greenway and streetscape recommendations. Work with GRG and Trailnet to implement the Trestle Project and the Branch Street trail improvements.
- Require new development, infill development and redevelopment projects to incorporate site-specific "micro-scale" stormwater applications. Recommended stormwater applications in this District include:
  - Green roof retrofits
  - Pervious paving for on-street parking
  - Stormwater curb extensions
    - Infiltration planters
    - Rain gardens

Figure 1.18 - North Broadway Complete Street Approach

AMENITIES

- Six to eight-foot wide sidewalks to promote limited street-level retail and streetscape amenities (trees, benches, lights, signage, rain gardens, etc.)
- On-street parallel parking to support street-front businesses.

Figure 1.17 - North Market Street Trestle View - Image courtesy of Great Rivers Greenway

Market District

AMENITIES

- Bike lanes within this District are preferred. However, right-of-way constraints may limit the ability to provide designated lanes. Bike lanes may be possible with narrower sidewalks and fewer amenities within the right-of-way.
- Street trees clustered to create a pedestrian-friendly environment. Tree species in this area should also have an open canopy and be limbed up to ensure appropriate visibility to businesses.
- Light fixtures shall include a standard street light and a historic pedestrian light standard to reflect and celebrate the history of the District and satisfy safety and security needs.
- Standard painted crosswalks at intersections to facilitate pedestrian crossings.
- Site furnishings at intersections with an urban character to complement and celebrate the history and function of the surrounding built environment. Along North Broadway Street, this character is exemplified within existing building materials that are simple yet reflect a sense of permanence.

LAND ASSEMBLY

- Focus on strategic infill opportunities:
  - Acquire parcels adjacent to existing buildings for expansion, storage, parking, etc.
- Redevelop underutilized blocks:
  - Acquire underutilized parcels with dilapidated and/or vacant structures for redevelopment.
  - Utilize CID or other local redevelopment authority to proactively acquire infill sites. Priority will be given to:
    1. Expansion of existing “Anchor” businesses;
    2. New businesses with a focus on supporting “food” industries to be compatible with and/or support St. Louis Produce Market ; and
    3. Parcels fronting North Broadway Street.

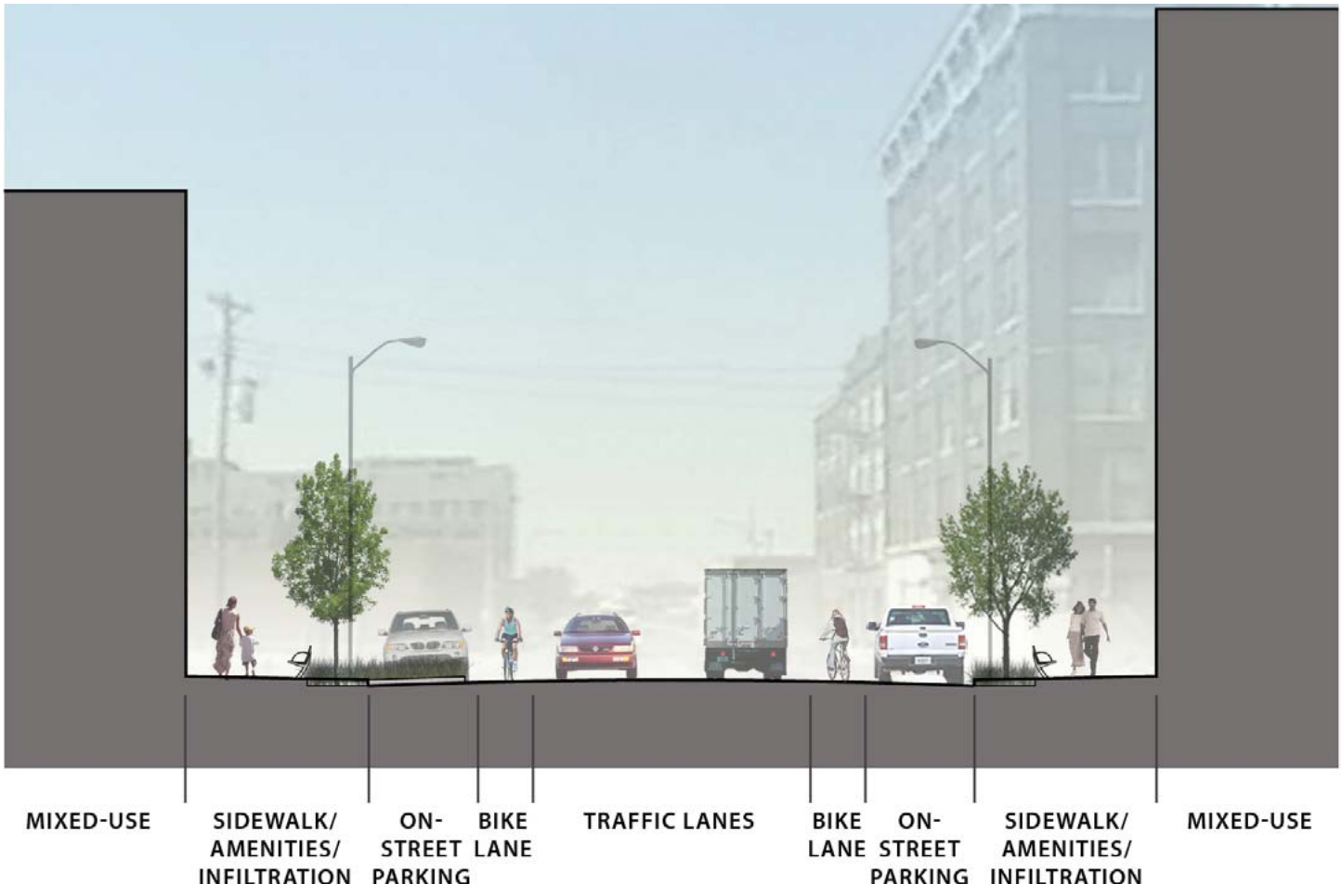

Figure 1.19 - Market District: North Broadway Street Section

Carrie District

VISION

- The Carrie District is industrial in nature catering to manufacturing and processing of high-value goods. This District is primarily intended for value-added manufacturing, distribution and support industries and businesses. Value-added manufacturing focuses on converting raw commodities, such as grain, into finished high-value products for distribution and sale.

LAND USE

- Primary Uses
  - Manufacturing, processing and assembly;
  - High-value warehouse and distribution with rail access;
  - Industrial flex space with ancillary office and retail; and
  - Service stations/convenience stores and restaurants including causal dining as well as fast food/drive-through. These uses are ideal at the East Grand and East Carrie exits due to direct highway access, visibility and availability of land.
- Secondary Uses
  - High-value warehouse and distribution centers with rail access; and
  - Industrial-flex space with ancillary office and limited retail.
- Discouraged Uses
  - Industrial uses; and
  - Outdoor salvage yards and scrap operations.

DEVELOPMENT GUIDELINES

- Surface parking areas facing North Broadway Street should be screened with a decorative wall and/or landscape.
- Outdoor storage is prohibited on parcels fronting North Broadway Street.

TRANSPORTATION AND INFRASTRUCTURE

- Incorporate ITS signage along I-70 northwest of the Carrie Avenue interchange to direct traffic to avoid delays.
- Incorporate native plant materials for landscape.
- Require new development, infill development and redevelopment projects to install and maintain site-specific "micro-scale" stormwater applications. Recommended stormwater applications in this District include:
  - Green roof
  - Bioretention
  - Bioswale infiltration
  - Extended detention
  - Infiltration

AMENITIES

- Directional wayfinding signage for businesses.
- Standard sidewalks to promote pedestrian connections between businesses.
- Improved street lighting for safety.
- Street trees clustered at intersections.
- Native landscape enhancements on the east-side of North Broadway Street adjacent to the Bellefontaine and Calvary Cemeteries and O'Fallon Park.

Figure 1.20 - Native landscape planting in I-70 right-of-way

LAND ASSEMBLY

- Assemble sites (10 to 40 acres) for value-added manufacturing uses.
- Utilize CID or other local redevelopment authority to proactively acquire strategic parcels. Priority will be given to:
  1. Expansion of existing "anchor" businesses;
  2. Sites for new value-added manufacturing businesses with significant jobs; and
  3. Parcels with frontage on North Broadway Street and convenient access to rail.

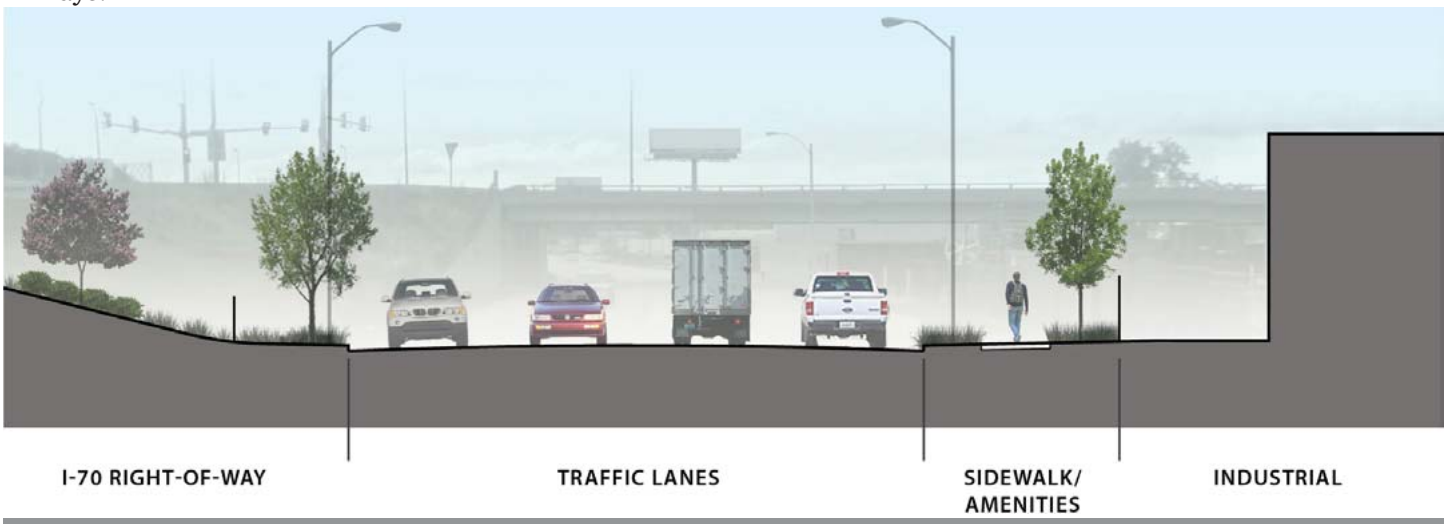

Figure 1.21 - Carrie District: North Broadway Street Section

Baden District

VISION

- Enhance North Broadway Street as a "Main Street" for the Baden Neighborhood and gateway to the NRCC.

LAND USE

- Primary Uses
  - Neighborhood-scale retail, office and professional services. Examples include:
    - restaurants;
    - coffee/donut/bakery shop;
    - grocery store;
    - banks;
    - drug stores;
    - dry cleaning;
    - flower shop, card store, etc.; and
    - small professional offices.
  - Institutional uses. Examples include:
    - restaurant;
    - library;
    - post office;
    - police and fire station;
    - park; and
    - school.
  - Incubator business space (all uses apply).
- Secondary Uses
  - Upper-floor residential; and
  - Service station/convenience store.
- Discouraged Uses
  - Industrial uses; and
  - Outdoor salvage yards and scrap operations.

DEVELOPMENT GUIDELINES

- Light fixtures should be designed to shine down onto the street and away from the windows of adjacent residential areas. Fixtures should also be designed to shield and/or mitigate excessive glare and light spillage.
- Buildings should be oriented to maximize street frontage; facades facing North Broadway Street should be designed to animate the street and provide visual interest to passing vehicular and pedestrian traffic. Active uses, such as retail and services, are encouraged on the first floor street level.
- On-street parking should be preserved.
- Surface parking lots are encouraged to be located at the inner block, behind or beside adjacent buildings.
- Outdoor storage is prohibited on parcels fronting North Broadway Street.

TRANSPORTATION AND INFRASTRUCTURE

- Promote a complete street by accommodating vehicles, pedestrians and bicycles.
- Require new development, infill development and redevelopment projects to incorporate site-specific "micro-scale" stormwater applications. Recommended stormwater applications in this District include:
  - Stormwater curb extensions
  - Rain gardens
  - Pervious paving surface parking

Figure 1.22 - Stormwater curb extension example

AMENITIES

- Wide sidewalks, minimum width of six-feet, with 10-feet in width or more desired in areas with retail and pedestrian activities including outdoor cafes. Where available, provide four-foot landscape strip between curb and sidewalk to promote pedestrian friendliness and provide stormwater opportunities.
- On-street parking: Parallel on-street parking to support retail and service businesses.
- Off-street parking: Located in rear of retail and support businesses where required.
- Bike lanes within this District are preferred, however, right-of-way constraints may limit the ability to provide designated lanes. Bike lanes may be possible with narrower sidewalks and fewer amenities within the right-of-way.
- Street trees: Upright, columnar trees, spaced or clustered to complement the neighborhood mixed-use character. Ornamental trees clustered at the intersection of North Broadway Street and Riverview Drive to act as a gateway to the District.
- Crosswalks: Decorative stamped paving or a change in paving material and/or paving color to demarcate crosswalks.

AMENITIES (CONTINUED)

- Light fixtures shall include a standard street light and a historic pedestrian light standard. Pedestrian light poles will include hanging baskets and/or banners to promote neighborhood identity. Spacing to be consistent for efficient, even lighting.
- Site furnishings at intersections and mid-block with an urban-neighborhood character to complement the commercial portion of the Baden Neighborhood.

LAND ASSEMBLY

- Focus on small strategic infill opportunities.
- Utilize CID or other local redevelopment authority to proactively acquire parcels with dilapidated buildings, underutilized surface lots and vacant lots. Priority will be given to:
  1. Expansion of existing neighborhood businesses;
  2. New neighborhood businesses; and
  3. Parcels fronting North Broadway Street.

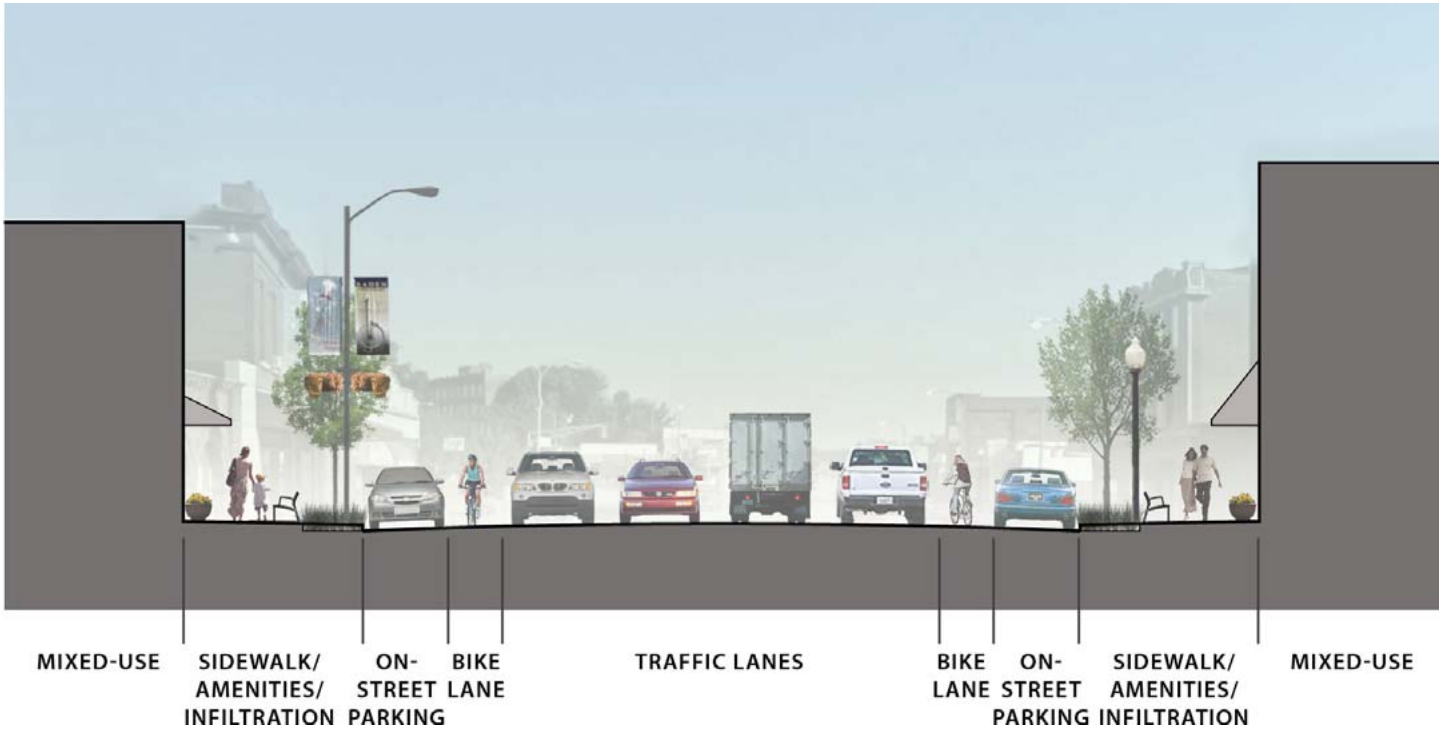

Figure 1.23 - Baden District: North Broadway Street Section

Hall District

VISION

- Maximize the Hall Street Corridor as a key multi-modal truck and rail hub by attracting large-scale warehouse and distribution centers.

LAND USE

- Primary Uses
  - Large-scale warehouse and distribution centers.
- Secondary Uses
  - Flex industrial space; and
  - Ancillary office space.
- Discouraged Uses
  - Single-use retail or professional office uses; and
  - Residential uses.

LAND ASSEMBLY

- Assemble large sites (40 to 80 acres or more) for regional warehouse and distribution centers.
- Utilize (CID) or other local redevelopment authority to proactively acquire large sites. Priority will be given to:
  1. Expansion of existing "Anchor" businesses; and
  2. Parcels with frontage on Hall Street and convenient access to rail.
- Investigate the feasibility of using parcels not suitable for development, such as the methane field, as a switching yard for the TRRA.

TRANSPORTATION AND INFRASTRUCTURE

- Incorporate ITS signage along Hall Street near the East Grand Avenue intersection and north of the East Carrie Avenue intersection to direct traffic to avoid delays.
- Hall Street (East Grand Avenue to Blase Avenue): To address flooding issues along Hall Street, improvements within this section of Hall Street will be targeted to improve drainage and limit localized flooding during rain events. Recommended improvements include:
  - Curb and gutter section for new development.
  - Engineered swales for infill development or redevelopment areas.
  - Install grated side-intake inlets at appropriate intervals to be determined through a system analysis of the area.
  - New separate storm sewers and shoulder swales leading to micro-scale stromwater retention facilities (i.e. rain gardens, etc.).
- Hall Street (Blase Avenue to Riverview Drive): To address flooding issues along Hall Street, and to provide a buffer to the adjacent Baden neighborhood on the west-side of the road, this section of Hall Street will include drainage improvements as well as a landscaped median. The median section will serve as an aesthetic enhancement and gateway to this portion of the Hall District. Additional benefits of a median section will be to serve as a traffic calming devise to discourage drag racing. The new drainage system will either be connected to two existing ponds (North and South Harlem) along East Taylor Avenue, or to east-west roadway outfall structures that discharge into the Mississippi River. Specific recommended improvements include:
  - Install curb and gutter on the east-side of the road: storm drainage inlets and an enclosed storm sewer pipe system.
  - Install engineered swales along the west-side of the road.
  - Install a landscaped median with breaks at major intersections and entrances to the St. Louis Business Center and other major developments.
- As development occurs, proactively acquire sites and construct and maintain macro-scale collective stormwater enhancements. The NRCC CID or other authorities should be responsible for long-term maintenance. Recommended macro-scale stormwater applications in this District include:
  - Permanent open space
  - Bioretention
  - Extended detention
- Require new development, infill development and redevelopment projects to install and maintain site-specific "micro-scale" stormwater applications. Recommended stormwater applications in this District include:
  - Pervious paving for employee/visitor parking
  - Green roof
  - Rooftop disconnection
  - Bioswale infiltration

AMENITIES

- Directional wayfinding signage for businesses.
- Consistent landscaping for Hall Street.

Figure 1.24 - Bioswale infiltration example

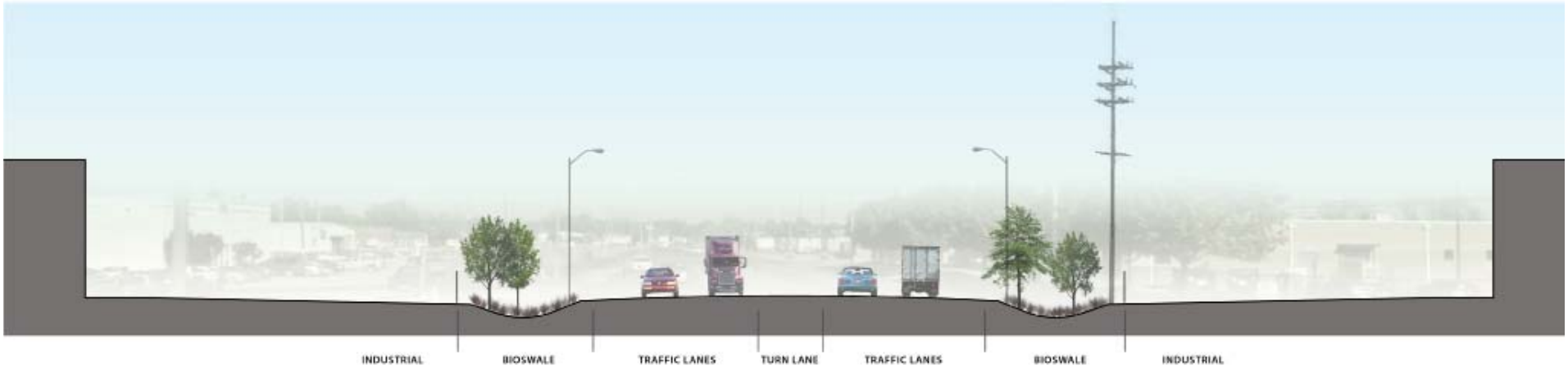

Figure 1.25 - Hall Street (East Grand to Blase Avenue) Section

Figure 1.26 - Hall Street (Blase Avenue to Riverview Drive) Section

2. ORGANIZATIONAL STRUCTURE

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2. Organizational Recommendations

Introduction

The NRCC is a mature, if somewhat out of date, urban business environment where development can be traced well back to the 19th century. While it has evolved primarily as an agglomeration of individual businesses, it is not difficult to discern patterns in that development—and existing land uses—demonstrating that market forces tended to link supportive business entities in mutually beneficial ways. Still, had the NRCC been developed in more recent times as a single-developer industrial or business park, the complementary land use relationships would likely have occurred more quickly and would likely be stronger. This is a typical advantage of single or concentrated management of business communities.

The challenge of the NRCC today is not development, of course, but redevelopment and modernization. There is an existing business organization representing the NRCC, but it has not constituted itself as a redevelopment/revitalization entity with resources and skills to effect necessary changes in the NRCC. In many ways, the NRCC relies on the SLDC and other city agencies to "manage" the NRCC. The relationship of NRCC and City interests, therefore, is informal at best.

There are many positive and strong elements of the NRCC that are favorable to business development: transportation infrastructure is diverse and plentiful, from highways to rails to river; utilities are likewise plentiful and affordable; the location is rated highly by existing businesses based on access to employees and to all parts of the St. Louis region and national and global markets; and City agencies generally receive high marks for the services they are able to provide.

However, there are numerous challenges: dilapidated and vacant buildings abound; available land parcels are often too small to attract 21st century businesses; road networks are not as efficient as they could be; there are too many vehicular conflicts between roads and rails; although there has been considerable investment in the MRT, infrastructure on the periphery needs to be upgraded in order for the area to remain competitive; while crime against businesses and employees is not a major issue, criminal activity in the NRCC is all too visible; and unappealing aesthetics of the area and safety are a primary concern of existing and emerging businesses.

These briefly summarized lists of strengths and challenges indicate a need for a collective organizational structure with a direct mission to improve the NRCC's business climate. The most successful business centers take matters into their own hands to improve and sustain the most favorable business climate possible. There comes a time when economic forces alone, even with reliance on public services, cannot assure long term competitiveness. Market trends, physical conditions, and social circumstances must be redirected to create a more attractive and competitive business climate.

Thus, it makes sense to create a single management entity within the NRCC that can directly represent local business interests in addressing current challenges and opportunities. Ideally, such a structure will enable all business and property owners to participate in a long term process leading to a much improved business climate, enhanced physical and social conditions, and strategic use of economic incentives.

Stages of Business Park Evolution

In the common jargon of organizational patterns, business concentrations like the NRCC (or downtowns, business parks, etc.) need organizational management to evolve through three broad phases of increasing maturity.

1. The "embryonic or catalytic" phase is the time when the area is just beginning to develop, to identify targeted tenants and property owners, and creating the physical and organizational infrastructure to thrive.
2. The "absorption or growth" phase is the time when the property fills up. Buildings are finished, occupants are leased, and property is sold to other owners. This phase lasts until the business park is effectively fully occupied.
3. The "management or final management" phase is, for all intents and purposes, a maintenance phase when it is important to serve the occupants of the park in order to retain them, to attract re-placement occupants that are compatible with the other users, and to upgrade the systems and services in the park to remain competitive and of high quality. Ideally, this is a permanent phase.*

** These terms are more fully defined in a number of real estate development and management texts. Two that were specifically consulted for this analysis are the Business and Industrial Park Development Handbook Second Edition by the Urban Land Institute (2001) and Revitalizing Main Street by the National Trust for Historic Preservation (2009). The consistency of the "theory" of business center management between types of centers (in these cases, business/industrial parks and downtown main streets) and over time is notable. There is a timelessness of the lessons to be learned and applied.*

The NRCC long ago reached a management phase, although it might be said that it never really reached such a phase because there has never been a strong oversight management entity to unite the NRCC as a single brand. It passed its embryonic or catalytic phase probably in the 19th century and completed its initial absorption or growth phase early in the 20th century.

During the management phase, a business district like the NRCC should operate like a shopping mall or well-managed business park. Ideally, a centralized management entity ensures that:

- Businesses adapt to changes in the marketplace.
- The NRCC's physical infrastructure, both private and public, is in good condition.
- The NRCC is as safe and attractive as possible.
- The NRCC's marketing strategy to attract new and retain existing businesses is targeted and effective.
- Potential threats to the NRCC's economic vitality are kept in check.

These are not, however, circumstances that are presently managed particularly well in the NRCC. In fact, it is more likely that the NRCC has reverted to a second "growth phase" in light of economic forces of the past several decades in St. Louis and the nation. There is so much land and so many existing buildings that are no longer productive in the NRCC that a substantial real estate inventory has been created than can be marketed to capture more growth—or more absorption. Major challenges of the growth phase are typically:

- To develop and implement a comprehensive economic development strategy for the NRCC—a strategy based on a firm understanding of regional and national market opportunities and limitations.
- To raise the capital required to complete major building rehabilitations, land redevelopment, and public improvement projects.
- To identify and take steps to overcome the regulatory, financial, and perception barriers that hinder full utilization of the NRCC's real estate and infrastructure assets.

The Plan is creating the development strategy noted in the first bullet point, above. While more encompassing than an economic development strategy, but incorporating such a strategy, the Plan defines the goals, justification, and strategy for a much improved NRCC. Accomplishing the other two bullets requires committed and long term efforts best accomplished by organizing the NRCC into a formal entity that combines resources to generate more growth.

Organizational Models

Implementation requires dedicated action under a disciplined time line with sufficient resources to accomplish the goals. To date, most such responsibilities for the NRCC have been undertaken by the SLDC, the Port of St. Louis, and other city agencies. It is in the interests of the NRCC, however, to create and staff a separate organization as a persistent advocate for businesses and property owners. This organization would necessarily create partnerships—formal, informal, and ad hoc—with other entities, including the City, to accomplish certain goals, but it is best if there is a strong organization whose day-to-day mission is to represent and improve the NRCC. Diagrammatically, such an organization would have the following characteristics.

- A board of directors representing the various types and sizes of companies, utilities, and property owners would oversee policy and hire an executive director. This board should also include important agencies of the City of St. Louis (e.g., SLDC and the St. Louis Port Authority) because of their importance in providing services in the NRCC. The board should not have more than 20 members in order to be most effective; even a dozen would be quite strong. By-laws should allow the board to self-replace retiring members, to the extent allowed by state law, in order to respond to contemporary needs.
- A paid executive director would manage the day-to-day responsibilities of the organization. These responsibilities should include, at a minimum:
  - Some form of supplemental security oversight to provide more "eyes on the street" with direct radio contact with the St. Louis Police and Fire Departments.
  - More frequent cleaning and simple maintenance of the public realm (streets, walls, lighting, etc.) than city agencies can currently provide.
  - A focused marketing and economic development program to retain desirable businesses and attract new and replacement businesses, including the application for and use of the wide variety of public financing and development incentives available for economic development.
  - Chamber of commerce types of services such as regular communications, special events, and education for members.
  - Political and related advocacy efforts to assure that city, state, and federal authorities are fully aware of the special circumstances affecting the NRCC.
  - Other services as needs and resources arise.

Figure 2.1 - Typical Organizational Structure

- Some or all of these services can be contracted out if necessary. It is not critical that in-house staff provide such services. As needs and resources increase, some services can be brought into the organization.

A range of organizational types should be considered.

- At present, there is a loose volunteer organization in the NRCC that convenes to discuss common issues and to keep area businesses informed about activities in the area. In effect, this organization is something of a chamber of commerce, but indications are that it is not raising substantial amounts of money and does not have a paid staff.
- At a minimum, this organization should be upgraded to a full-scale chamber of commerce. Raising money through dues and other relevant revenue sources, a NRCC Chamber of Commerce would hire an executive director whose charge would be to promote the area as a place to do business, to provide informational and educational services to member companies, and to advocate through market and political channels for improvements in the NRCC. A drawback to chambers of commerce, however, is that they are voluntary. Businesses and property owners join only if they see tangible benefits to their operations. Chambers of commerce are, however, rarely involved with economic development unless separate resources are raised and separate staff is involved.
- A further evolution is to create an organization that requires financial contributions from all parties in the NRCC. This is typically accomplished in Missouri with state-enabled Community Improvement Districts, or CIDs*. CIDs have boards of directors separate from city agencies and chambers of commerce, though they are often associated with, and perhaps staffed by, a chamber. An advantage of CIDs is that they raise money through legal assessments on property (or, in the case of Missouri, as additional sales taxes). That way, every property owner and—by extension every business has a "fair share" of the resources committed to the CID and, therefore, a stake in the CID's mission, Typically, this also raises sufficient funds to undertake significant redevelopment, revitalization, security, and maintenance initiatives. Volunteer chambers of commerce do not have this "forced funding" power.
- Because the NRCC is so closely related to the Mississippi River and the Port of St. Louis, Missouri law also enables a related organizational and fund raising option called a Port Improvement District, or PID. Such an organization would be operated under the aegis of the Port of St. Louis and would not have a separate board of directors as would necessarily be created for a CID.

For purposes of creating sufficient resources and management authority to implement recommendations of this Plan, the CID or PID options are likely necessary. These are evaluated in the following section. CIDs in Missouri are, for all intents and purposes, the same as the more generically named business improvement districts (BIDs) common in many other states. Every state generally enables such organizations but many have varying degrees of powers and funding capacities.

Community Improvement Districts and Port Improvement Districts

The NRCC is, for most intents and purposes, a large commercial district not unlike most industrial parks, business parks, or even downtowns. A great deal of business-to-business commerce is conducted in the NRCC, there are major flows of goods and services, and there is a unification factor linking NRCC establishments to one another.

It is a finding of this Plan that the NRCC could markedly benefit from a well-funded umbrella organization that provides services common to all parts of the NRCC, so two powerful options available under Missouri law are evaluated:

1. Community Improvement District (CID) which is Missouri's nomenclature for the widely implemented "business improvement district" model, or BID. CIDs are established as separate entities with independent boards of directors.
2. Port Improvement District (PID) which can have similar powers as a CID but is essentially an extension of, and is managed by, a port authority.

PIDs are, by their very nature and management, established as municipal corporations under state law with limited powers and limited property and/or sales taxing authority. Port authorities already have such powers; these would be extended to the entire PID.

CIDs can be either municipal corporations with limited powers and limited property and/or sales taxing authority, or they can be created as not-for-profit corporations with assessment authority on private property. That is, revenues are raised from "special assessments" on private property owners in the district.

Both districts are created by petition of property owners, though the specific requirements differ:

Community Improvement Districts (CIDs):

- must be approved by property owners owning more than 50 percent of property by assessed value;
- must be approved by more than 50 percent of the property owners;
- must include a five-year plan describing purposes of district, improvements to be provided, cost estimates of improvements, duration of any tax, limitations of the district, maximum rate(s) of assessments; and any
- other items deemed appropriate. In the case of the NRCC, these latter requirements can be extracted in the appropriate format from the Plan.

Port Improvement Districts (PIDs):

- must be approved by more than 60 percent of all owners of real property within PID boundary and must receive circuit court certification of the projects and approval of real property and/or sales tax imposition;
- must hold a public election, if necessary, of qualified voters in the district to approve any sales or use tax; and
- must include a list of improvements to be provided, cost estimates of improvements, maximum rate(s) for any tax, duration of any tax, and estimated revenues from taxes.

Again, much of the information to fulfill these latter requirements can be extracted from the Plan. Specified powers and responsibilities of the two types of districts also vary.

Community Improvement Districts can fund capital improvements and/or public services including:

- site improvements (sidewalks, landscaping, lighting, etc.);
- any other necessary or desired improvements; and
- public services such as:
  - restrictions on vehicular and pedestrian traffic;
  - provision of parking facilities or transportation services;
  - provision of security personnel and cleaning services;
  - promotion of business activity; and
  - economic development planning, marketing, and other studies.

Port Improvement Districts can fund qualified project costs only for approved projects including:

- environmental cleanup;
- energy conservation;
- wetlands preservation or relocation;
- development of essential structures/facilities;
- property acquisition; and
- construction/rehabilitation of facilities/structures.

In essence, PID expenditures are generally limited to capital projects while CIDs can fund both capital improvements and services. The latter, however, are in addition to, not in replacement of, services normally provided by local government. For example, a CID can create a public safety patrol to identify and alert the police department of possible violations of law, but only the police can enforce the law. The police will be required to maintain normal patrols of their own, just as in the past.

PIDs are, by law, managed under the auspices of an existing port authority. In the case of the NRCC, the contractor that manages the MRT might also be contracted to manage day-to-day responsibilities of the entire PID.

CIDs, while also separate and independent corporate entities, often contract for day-to-day management. This might take the form of, say, an executive director of the CID, or it might take the form of hiring another entity (say, a coexistent chamber of commerce) to manage the CID. The CID board, of course, would remain separate from a coexistent organization's board.

CID and PID Funding Comparisons and Analysis

The following analysis serves to estimate an order-of-magnitude amount of funds that could be generated by the NRCC CID or PID. Because the NRCC has few retail sales, however, this memo focuses on the effects of a real property special assessment (CID) or an additional real property tax (CID or PID). Sales tax funding options are ignored.

DOWNTOWN ST. LOUIS CID AS BACKGROUND

St. Louis has many CIDs throughout the city. The best local model, however, is the Downtown CID due to its proximity to the NRCC, the complexity and scale of its economic activities, and the availability of information about the structure and operations of that CID. The Downtown CID encompasses 165 blocks of downtown St. Louis with a total assessed value of $525.9 million and is organized as a non-profit corporation. The CID levies a special annual assessment on private, real property owners located within the district. That assessment is "attached" to each property's annual tax bill and is a legally required payment. The structure of the downtown special assessment is as follows:

- Land and Ground Floor Assessment Rates: 9.12 cents per square foot (unless condominiums).
- Each Upper Floor: 4.88 cents per square foot.
- First-Floor Condominium Units (where applicable): 4.88 cents per square foot.

Rates are projected to increase four percent per year through the end of the CID in 2021. Actually, it is a statutory requirement that CIDs "sunset" after a specified number of years, but they are renewable (as the Downtown CID recently was) via a vote of the affected property owners.

According to the Partnership for Downtown St. Louis, the Downtown CID obtains approximately $2.8 million annually in revenues from the above formula. This budget amount is approximately 0.5 percent of the total assessed value of property in downtown St. Louis (a percentage applied to the NRCC later in this analysis).[*1]

SPECIAL ASSESSMENT REVENUES

Using the revenue-generating structure of the Downtown CID as a guide, three sets of potential revenues for a NRCC CID are estimated below through the use of a special assessment or an additional tax on real property. If a special assessment is used, the CID must be established as a not-for-profit corporation, just like the Downtown CID.

- The first analysis shows a "low" scenario that yields total revenues that are approximately the same percentage of total assessed value as revenues in the Downtown CID.
- The second analysis details a "high" scenario using the same ground and first floor area assessment rate currently for the Downtown CID.
- The third analysis assumes a "middle" scenario where the NRCC CID would obtain revenues of $2.8 million annually, the same dollar amount as the Downtown CID.

Because there are few multi-story buildings in active use in the NRCC, "upper story" assessment rates are not factored. Thus, to achieve the "low" scenario rate of assessment, the rate must apply only to the land/ground floor square feet. For this "low" scenario, it is assumed that a NRCC CID must achieve revenues totaling 0.5 percent of the overall assessed value of the NRCC, same as the Downtown CID. Several property owners in the NRCC have to be excluded from this assessment because they are tax-exempt. These exclusions are for the City of St. Louis, State of Missouri, MSD, Bi-State Development Agency/Metro, and Great Rivers Greenway.[*2] The following table shows the total revenues that could be generated annually in the "low" scenario by using current information on the amount of land and ground floor area in the NRCC.

North Riverfront Improvement District Funds Generated
Low Scenario: $0.05 per Sq. Ft. Land/Ground Floor

All Developable Land	**$560,500**
Non-taxable Entities	
City-Owned Property	$89,200
State-Owned Property	$4,000
MSD-Owned Property	$23,400
Bi-State-Owned Property	$56,200
GRG-Owned Property	$1,300
Total	**$174,100**
Total Available to Improvement District*	**$386,400**

Table 2.1 - NRCC Improvement District Funds Generated: Low Scenario

*[*1] Information obtained from the Partnership for Downtown St. Louis. The Partnership, however, is not the same as the CID. CIDs are separate corporations with separate boards of directors from, say, a local chamber of commerce or other business organization. The Downtown CID formally contracts with the Partnership for Downtown St. Louis (which is fundamentally a chamber of commence) to manage and staff the CID. This creates many economies of scale and management efficiencies for both organizations.*

*[*2] Exemptions exist also in the Downtown CID, though some "tax-exempt" establishments in the Downtown CID have agreed to either pay the assessment anyway because they benefit from the services, or to formally contract with the CID to provide such services on their properties, effectively paying the assessment without having to call it an assessment. Depending on the services that would be provided by a NRCC CID, similar arrangements with tax-exempt property owners might be negotiated, but such additional revenue potential is not assumed herein.*

While initiated as simply a 0.5 percent of assessed valuation, this revenue of $386,400 would effectively result from an annual assessment rate of 0.5 cents per square foot of land or ground floor area, or 0.5 percent of the total assessed value of the NRCC of $84.9 million. Again, the Downtown CID's annual revenues equal approximately 0.5 percent of the total assessed value for the area.

Under the "high" analysis, the Downtown CID rate of 9.12 cents per square foot of ground or first floor area is applied. Again, this analysis excludes the tax-exempt property owners listed above. The following table shows that this "high" scenario can generate almost $7.0 million in annual revenues for the CID. This is, however, about 2.5 times the revenue generated for the Downtown CID.[*1]

North Riverfront Improvement District Funds Generated
High Scenario: $0.912 per Sq. Ft. Land/Ground Floor

All Developable Land	**$10,224,191**
Non-taxable Entities	
City-Owned Property	$1,627,600
State-Owned Property	$73,500
MSD-Owned Property	$426,900
Bi-State-Owned Property	$1,024,400
GRG-Owned Property	$22,900
Total	**$3,175,300**
Total Available to Improvement District*	**$7,048,891**

Table 2.2 - NRCC Improvement District Funds Generated: High Scenario

A "middle" scenario assumes that the NRCC would capture the same amount of CID revenue as the Downtown CID– $2.8 million annually. There is no magic to this number; it is simply a benchmark for discussion. The $2.8 million also generates sufficient funds for Downtown St. Louis to afford a range of services noted later in this analysis and, therefore, might be a good starting point for discussing revenue needs for the NRCC. The assessment rate per square foot of land/ground floor would be 3.62 cents ($0.0362).

North Riverfront Improvement District Funds Generated
Middle Scenario: $0.362 per Sq. Ft. Land/Ground Floor

All Developable Land	**$4,061,310**
Non-taxable Entities	
City-Owned Property	$646,500
State-Owned Property	$29,200
MSD-Owned Property	$169,600
Bi-State-Owned Property	$406,900
GRG-Owned Property	$9,100
Total	**$1,261,300**
Total Available to Improvement District*	**$2,800,000**

Table 2.3 - NRCC Improvement District Funds Generated: Middle Scenario

NRCC – REAL PROPERTY TAX REVENUES

A CID can alternatively be established as a municipal corporation, just as a PID. As such, either can impose an additional tax on real property in order to fund allowable expenditures. There is no statutory cap on the amount of such an additional tax rate; it is limited only by the approval of the tax payers.

It is assumed herein that any tax on real property will be levied on the full assessed value of each property, both land and improvements.[*2]

The current assessed value of all property in the NRCC is $84,904,200. Certain properties are classified here as tax-exempt, as noted earlier. The assessed value of tax-eligible land in the NRCC, therefore, is $67,952,200.

In order to determine the possible additional real property tax rate in the NRCC, the total revenue numbers shown above for the low, high, and middle scenarios are maintained. Tax rates were determined by "working backward" to determine what the additional property tax rate would have to be, when charged against the assessed value, to achieve such revenues. Under the low scenario, with annual revenues of $386,400, the additional property tax would have to be about 57 cents ($0.57) per $100 of assessed valuation.

North Riverfront Improvement District Real Property Tax Funds Generated
Low Scenario: $0.57 per $100 Assessed Value

All Developable Land	**$482,800**
Non-taxable Entities	
City-Owned Property	$32,900
State-Owned Property	$2,900
MSD-Owned Property	$52,400
Bi-State-Owned Property	$7,600
GRG-Owned Property	$500
Total	**$96,300**
Total Available to Improvement District*	**$386,400**

Table 2.4- NRCC Improvement District Real Property Tax Funds Generated: Low Scenario

*[*1] This large difference is attributable to the much larger amount of land area in the NRCC district than Downtown, even though Downtown also levies an assessment on upper stories.*

*[*2] There may be reasons to tax only the land portion of assessed value because all properties have land, but some properties have no or very few improvements. That said, properties with higher-value improvements are also properties that, while paying more in this assessment because of the higher values, likely have more economic activity requiring CID or PID services.*

This added tax rate would increase the current commercial tax rate of $8.56 per $100 assessed value by about 6.7 percent.

Under the "high" scenario, shown on the next table, the tax rate would need to be $10.37 per $100 assessed value to achieve revenue of just over $7 million per year. Unfortunately, this additional tax rate, alone, would be about 1.2 times the current tax rate. It is unlikely that property owners will want to more than double their taxes to support CID or PID operations.

North Riverfront Improvement District Real Property Tax Funds Generated High Scenario: $10.37 per $100 Assessed Value	
All Developable Land	**$8,807,400**
Non-taxable Entities	
City-Owned Property	$599,900
State-Owned Property	$53,500
MSD-Owned Property	$955,800
Bi-State-Owned Property	$139,200
GRG-Owned Property	$9,200
Total	**$1,757,600**
Total Available to Improvement District*	**$7,048,900**

Table 2.5- NRCC Improvement District Real Property Tax Funds Generated: High Scenario

The middle scenario would generate the same amount of annual funding as currently achieved in the Downtown CID, or $2.8 million. As shown below, this would require an added property tax of $4.12 per $100 assessed value in the NRCC, increasing the current tax rate by 48 percent.

North Riverfront Improvement District Real Property Tax Funds Generated Middle Scenario: $4.12 per $100 Assessed Value	
All Developable Land	**$3,498,500**
Non-taxable Entities	
City-Owned Property	$238,300
State-Owned Property	$21,200
MSD-Owned Property	$379,700
Bi-State-Owned Property	$55,300
GRG-Owned Property	$3,700
Total	**$698,200**
Total Available to Improvement District*	**$2,800,000**

Table 2.6- NRCC Improvement District Real Property Tax Funds Generated: Middle Scenario

CASE EXAMPLES OF SPECIAL ASSESSMENT AND REAL PROPERTY TAX ON VARIOUS PROPERTY TYPES

For illustration purposes, two specific examples show the impact of these various rates on actual properties in the NRCC. First, is the Grossman Iron & Steel site, a large recycling and sorting center. Grossman consists largely of unimproved property used for storing inventory. That is, there is very little in the way of taxable improvements on the property. The following details the assessed values of the property, total ground and first floor square footage, and the impact of the various proposed funding scenarios on this business.

Assessed Land:
$345,400
Assessed Improvements:
$218,900
Total Assessed Value:
$564,300

Total Square Feet (Including Land and First Floor Area):
770,931

Thus, the Grossman site would have to pay $3,855 per year under the low scenario if the CID is a non-for-profit corporation, or $3,209 per year if it is set up as a taxing entity. Under the high scenario, Grossman's contribution would be $70,309 or $58,537, respectively.

In contrast to a business that has a large parcel with little improvements, P&G, a manufacturing company, has relatively little land but many more taxable improvements. The following details the assessed values of the property, total ground and first floor square footage, and the impact of the various proposed funding scenarios on this business.

Assessed Land:
$310,800
Assessed Improvements:
$1,651,700
Total Assessed Value:
$1,962,500

Total Square Feet (Including Land and First Floor Area):
801,620

Assessed Value Example: Grossman Iron & Steel			
	Scenario		
	Low	Middle	High
CID as Not-for-Profit Corporation			
Special Assessment Rate by Square Foot of Land or Ground Floor Area	$0.005	$0.036	$0.091
Estimated Special Assessment for Grossman	$3,855	$27,928	$70,309
CID or PID as Municipal Corporation			
Real Property Tax Rate per $100 of Assessed Valuation	$0.569	$4.121	$10.373
Estimated Real Property Tax for Grossman	$3,209	$23,252	$58,537

Table 2.7- Assessed Value Example: Grossman Iron & Steel

Assessed Value Example: Procter & Gamble			
	Scenario		
	Low	Middle	High
CID as Not-for-Profit Corporation			
Special Assessment Rate by Square Foot of Land or Ground Floor Area	$0.005	$0.036	$0.091
Estimated Special Assessment for Procter & Gamble	$4,008	$29,040	$73,108
CID or PID as Municipal Corporation			
Real Property Tax Rate per $100 of Assessed Valuation	$0.569	$4.121	$10.373
Estimated Real Property Tax for Procter & Gamble	$11,159	$80,866	$203,576

Table 2.8- Assessed Value Example: Proctor & Gamble

Grossman Iron & Steel and P&G occupy roughly the same land area. Therefore, the impact of any special assessment based on land area and the first floor area of any buildings is roughly the same. However, P&G has invested heavily in improvements on its property. In fact, the total assessed value of P&G's property is roughly 3.5 times greater than Grossman's. Consequently, real property taxes that could be levied on a manufacturing concern like P&G are much higher than those that would be levied on a relatively low-value property like Grossman.

As shown by the above examples, the impact of a special assessment on land and first floor area or a real property tax varies depending on the use and improvements on a given property.

- Imposition of a real property tax could be rationally supported by arguing that those property owners of "high value" properties like P&G have a greater interest in the improvement of the NRCC because of their higher value operations and, therefore, should be willing for paying those higher taxes.
- This argument can be countered by arguing that the variety of business types in the NRCC, ranging from manufacturing to storing transportation equipment, requires distinctly different uses of land ranging from high-tech buildings to raw land, but all of these businesses are equally invested in the continued improvement of the area. In this scenario the fairer approach would be to levy a special assessment on the land only.

Regardless of the approach chosen to fund improvements in the NRCC, the interests of all business owners, the financial impact to those businesses, and the impact of any special assessment or real property tax on the future development of the NRCC must be considered and a funding solution determined. It is too early, however, to make such recommendations in this Plan.

USE OF FUNDS - DOWNTOWN ST. LOUIS CID VS. NRCC IMPROVEMENT DISTRICT[*1]

The projected revenue for the Downtown St. Louis CID in 2011 is approximately $2.8 million. These monies are used to fund various projects including security services, certain maintenance services, economic and housing development, communications, special events, and administration. Many of these activities—including security, maintenance, economic development, and administration—could also benefit the NRCC CID, though a strategic analysis of such needs and proportions has not been conducted.

Below is outlined the breakdown of expenditures in the Downtown CID and a possible breakdown for a NRCC CID. In effect, it is assumed that no "special events" are necessary in the NRCC, so the percentages are redistributed to the other categories. Moreover, "housing" would likely be excluded from any NRCC expenditures, focusing all such funds on promoting the area for economic development.

The following table details the breakdown of revenues under the Downtown St. Louis CID and the potential breakdown of revenues for the NRCC CID scenarios.

Note that the spending categories and amounts might not apply as readily to a PID format. PID expenditures are restricted to a greater emphasis on capital improvements while the CID format allows for both capital and services spending. Therefore, the table reflects only the possible similarities with the Downtown CID. As discussions ensue about the most appropriate form of the NRCC management, more detailed budget and spending scenarios should be developed.

CID VS. PID: ORGANIZATION, REVENUE GENERATION, AND APPLICATION

There are both positive and negative aspects concerning the CID and PID organizational structures in relation to the NRCC. A CID, for instance, may be either a quasi-governmental entity or a non-profit corporation and offers more flexibility in structure, revenue generation, and expenditures than a PID. However, a CID requires a dual approval process for its creation and assessments: owners of 50 percent of the assessed value of real property in the district and 50 percent of all real property owners must approve the creation of a CID and any assessment.[*2] The NRCC has many diverse property owners, and achieving this dual requirement may prove onerous, but that is also one of the checks or balances to assure that the most favorable organizational and funding structure emerges.

Furthermore, the ability to levy a special assessment on the square footage of the ground and first floor, while seemingly fair to all property owners, may be seen as excessive to property owners of parcels of relatively little value. A well-thought out business plan, therefore, is necessary to assure an acceptable degree of fairness in both revenue collection and annual spending.

Funds Generated by Special Assessment or Property Taxes: Breakdown of Expenditures

	Downtown St. Louis CID	North Riverfront Community Improvement District			
		Percent	Low	Middle	High
Security	39.2%	43.0%	$ 166,200	$1,204,000	$3,031,000
Maintenance	29.0%	30.0%	115,900	840,000	2,114,700
Economic Development & Housing	15.6%	15.0%	58,000	420,000	1,057,300
Communications	6.0%	5.0%	19,300	140,000	352,400
Special Events	3.2%	0.0%	-	-	-
Administration	7.0%	7.0%	27,000	196,000	493,400

Table 2.9- Funds Generated by Special Assessment or Property Taxes Breakdown of Expenditures

*[*1] The Plan land use recommendations include references to a limited amount of live/work housing within the Market and Baden Districts. Thus, some funding to encourage housing might actually be in order, but it is ignored here for the time being.*

*[*2] This duality is intended to prevent dominance by a single or a few large property owners. For example, a single owner might control 51% of the real estate and thus could exercise monopoly control over all the other owners if only 51% of the property ownership was required. Thus, it also requires that at least half of all named owners approve of the CID, too. If that same 51% owner fears domination by the smaller owners, he or she also effectively has veto power.*

Another positive factor about CIDs is that the property owners themselves create the board of directors which can then hire its own staff to manage the operations of the CID.

On something of another hand, a PID must be administered by the Port Authority, weakening some power of the property owners. While this autonomy can help to streamline the organizational and administrative process, property owners in the area may resent their lack of control over the actions of the PID and view the government-imposed real-property tax as burdensome.

Recommendation

Based on an analysis of organizational models, the CID is a viable mechanism for funding potential improvements identified within this Plan. However, for any organization to be successful, the form and function should be self-determined by area property owners, business owners and key stakeholders.

Regardless of which organizational structure is chosen for the NRCC—or another one all together—care must be taken to effectively provide and communicate the benefits to current property owners and tenants, ensure the transparency of all operations, and respond to the changing needs of owners and users of the NRCC.

It is the recommendation of this Plan that the NRCC:

- Strengthen its existing organization to become a full-fledged chamber of commerce for purposes of creating a stronger educational and advocacy basis for NRCC interests; and
- Consider the creation of a separate, though closely related, community improvement district to raise sufficient funds from all property owners that would be utilized to implement strategic capital improvements and services in the NRCC. This organization will be created and sustained by property owners within the NRCC.

3. FUNDING AND FINANCING STRATEGIES

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3. Funding and Financing Strategies

Business Incentives

Current businesses within the NRCC and businesses considering opening or relocating to the NRCC have access to a wide variety of incentives ranging from city-level incentives designed to encourage small business growth to federal programs to support the growth of larger organizations. Development incentives to rebuild and reuse urban areas are also widely available, and some programs exist to help fund much-needed infrastructure improvements. It should be noted there are few programs to attract developers and businesses from similar locations in the region.

Although there are many applicable incentive programs, little assistance is available to businesses in the NRCC that would likely qualify for those incentives. The SLDC and some private entities, such as Ameren, offer support for the incentive application process to businesses across the City and St. Louis region, but there is no focus on marketing specific programs to distinct areas like the proposed districts in the NRCC.

The project team has researched many incentives ranging from private programs to federal economic development incentives. The incentives that have been researched fall roughly into three categories: Financial Incentives, Development Incentives and Job Growth Incentives.

Financial Incentives

Financial Incentives are provided to businesses by federal, state, and local government along with some private groups. Generally, financial incentives are structured to provide low-cost financing for capital projects and other expenditures. It is assumed that the availability of low-cost financing encourages development, business growth, and infrastructure improvements. Many of these programs require the entity providing the incentive to become a part-owner of the project or guarantee the loan. Most federal financial incentives are subject to the availability of funds.

Some financial incentives have the potential to be marketed to businesses in all districts of the NRCC including:

- **TAX-EXEMPT BOND FINANCING:** This bond incentive provides long-term capital financing for major projects.
- **CHAPTER 100 BOND FINANCING:** This bond incentive provides long-term capital financing for major projects.
- **CHAPTER 100 SALES TAX EXEMPTION:** Used in conjunction with Chapter 100 Bonds, the Chapter 100 Sales Tax Exemption reduces the costs of purchasing non-manufacturing equipment.

Other financial incentives could be applied to distinct areas of the NRCC.

- **EXPORT FINANCE PROGRAM:** This incentive assists companies in attaining export financing in order to increase international sales. This program would likely be used in the Working Riverfront and Hall Districts due to their focus on distribution of goods.
- **PRIVATE ACTIVITY BOND ALLOCATIONS:** This bond incentive was created to assist small manufacturers and provide funding for some infrastructure improvements. This incentive would be very desirable to the small manufacturing companies within the Carrie District. Additionally, this incentive may be marketed to other businesses in all districts as a means of raising funds for infrastructure improvements.
- **THE SMALL BUSINESS ASSOCIATION 7(A) LOAN GUARANTY:** The SBA provides financing to small businesses with reasonable terms. The Market, Carrie and Baden Districts provide an ideal location for small business. The SBA 7(a) Loan Guaranty can be utilized to attract business to these areas.

Development Incentives

The NRCC has a long history as an urban commerce core focused on river, rail, and highway distribution along with manufacturing, wholesaling, and other business. Due to its long history, much of the area is considered inadequate in terms of lot size, existing building condition, and environmental factors.

To combat the issues of attracting tenants to sites in need of redevelopment, many development incentives are provided by the federal government, state of Missouri, and City of St. Louis. Programs range from assistance with redevelopment of contaminated sites provided by Brownfield Remediation Tax Credits to site assembly through Land Assemblage Tax Credits. Most, if not all, development incentives encourage or require the redevelopment of existing sites instead of utilizing green-field, or previously undeveloped areas. Most development incentives take the form of loans, tax credits, or tax abatements and have specific project requirements and duration.

The following programs offer developers tax credits that can be leveraged to secure funds for construction or reduce tax liabilities. These programs include:

- **NEW MARKETS TAX CREDITS (NMTC):** These credits are typically used to attract investments to low-income areas and offer tax credits for a portion of the investment. Typically, these credits are utilized for large areas of redevelopment to increase the return on investment. It is possible that some or all of the areas of the NRCC would be eligible for these credits.
- **HISTORIC TAX CREDITS:** Many buildings in the Market, Carrie and Baden Districts may qualify for Historic Tax Credits, a program to preserve and adapt existing buildings for contemporary uses.

- **LAND ASSEMBLAGE TAX CREDIT:** This credit is used to assemble large parcels of land for development. The Working Riverfront and Hall Districts could greatly benefit from a developer or other entity utilizing this credit.

Programs exist to ensure the marketability of properties within a market area. These programs include:

- **BROWNFIELD REMEDIATION TAX CREDITS:** Many parcels throughout the NRCC area are in need of remediation and could utilize this credit to make formerly contaminated properties attractive to developers.
- **CERTIFIED SITES:** Provides developers with specific guidelines and standards regarding the availability and development potential of commercial and industrial sites. This program could be applied to all areas of the NRCC.

Job Growth Incentives

Many of the incentives mentioned above indirectly fuel business and/or job growth through building construction, expansion, and other investments that allow businesses to grow operations and hire more employees. Programs that directly impact the growth of business and jobs exist on the state and federal level. These include financial bond incentives that require job creation, tax credits that are contingent on job creation or business investment, loans with deferred payments contingent upon job creation, tax credits for above-average income jobs created, and tax credits for businesses that locate, relocate, or expand their businesses in distressed communities.

Some business and job growth programs will likely be marketed throughout the NRCC including:

- Rebuilding Communities Tax Credit;
- Grow Missouri Loan Fund; and
- Enhanced Enterprise Zone Tax Benefits.

These three programs provide funds or credits to a wide range of business types for business growth or job creation. The Working Riverfront, Carrie and Hall Districts will likely benefit from these funds and credits.

- **BUILD PROGRAM:** Missouri's financial bond incentives require the creation of at least 100 new jobs. Many of these jobs would likely come from the manufacturing and distribution sectors.
- **QUALITY JOBS PROGRAM:** Provides tax credits to a company for each job created that pays above the average county wage. These credits could be targeted within the Market, Carrie and Baden Districts to attract companies that typically pay higher-wages. These companies would likely occupy the office, flex, and incubator space planned throughout these districts.

Marketing and Implementation of Incentives

There is little marketing of specific incentives to businesses or developers interested in the NRCC. A dedicated organization that effectively markets specific programs to different business types for each distinct district in the area is necessary to attract and retain redevelopment and new business to the area. Furthermore, a business investigating relocation has many options available in the St. Louis region including sites that are clean and ready for construction or occupation. Again, a dedicated organization is needed to offer as much assistance as possible to businesses in applying for incentives.

Transportation and Infrastructure Funding

The NRCC suffers from aging infrastructure that does not meet the need of existing and future users. Electrical service is outdated for today's usage requirements. Similarly, the existing roadway, water, and sewer infrastructure is considered obsolete for today's business requirements.

While many development incentives indirectly promote the renovation of infrastructure through low-cost financing for capital projects or other funding activities, there are a few specific programs that directly promote infrastructure development and/or conservation of energy and other resources

Federal Aid Apportionments

Traditional sources of funding for transportation projects include the following federal programs from the Safe Accountable Flexible Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU):

- Interstate Maintenance Funds (IM)
- National Highway System (NHS)
- Surface Transportation (STP)
- Highway and Bridge (HBP)
- Congestion Mitigation and Air Quality (CMAQ)
- Highway Safety Improvement (HSIP)
- Metropolitan Planning (MP)
- Rail-Highway Crossings
- High Priority Projects (HPP)
- TIGER Grant Programs

Most transportation projects, including maintenance projects, receive funding through one of these programs, which pool funding from a variety of taxes or fees and allocate them to several projects. A brief summary of each program follows. More information can be found at the following link: *http://www.fhwa.dot.gov/safetealu/factsheets.htm.*

INTERSTATE MAINTENANCE FUNDS (IM)
The program provides funding for resurfacing, restoring, rehabilitating and reconstructing (4R) most routes on the interstate system. Each state shall receive a minimum of a half-percent percent of combined IM and National Highway System apportionments. The federal share is 90 percent, subject to a sliding scale adjustment.

NATIONAL HIGHWAY SYSTEM (NHS)
The program provides funding for improvements to rural and urban roads that are part of the NHS, including the interstate system and designated connections to major inter-modal terminals. Each state is to receive a minimum of a half-percent of combined NHS and interstate maintenance apportionments. The federal share is generally 80 percent, subject to a sliding scale adjustment.

SURFACE TRANSPORTATION (STP)
The program provides flexible funding that may be used by states and localities for projects on any federal-aid highway, including the NHS, bridge projects on any public road, transit capital projects, and intra-city and inter-city bus terminals and facilities. Several key components of STP funding may apply to the NRCC including Rail-Highway Crossing Hazard Elimination in High Speed Rail Corridors and advanced truck stop electrification systems. Each state is to receive a minimum of a half-percent of the funds apportioned for STP. The federal share is generally 80 percent, subject to a sliding scale adjustment.

HIGHWAY AND BRIDGE (HBP)
The program provides funding to enable states to improve the condition of their highway bridges through replacement, rehabilitation, and systematic preventive maintenance. The federal share is generally 80 percent, subject to sliding scale and 90 percent for Interstate projects.

CONGESTION MITIGATION AND AIR QUALITY (CMAQ)
CMAQ provides funding for projects and programs in air quality non-attainment and maintenance areas for ozone, carbon monoxide (CO), and particulate matter (PM-10, PM-2.5) which reduce transportation related emissions. This applies to the St. Louis metropolitan area, which is in non-attainment for ozone and PM-2.5. The federal share is generally 80 percent, subject to sliding scale and 90 percent for interstate highway projects. SAFETEA-LU added a requirement that states and MPOs will give priority to projects and programs to diesel retrofits and other cost-effective emission reduction activities, and congestion mitigation activities that provide air quality benefits. Eligibility was also expanded to include projects and programs that:

- establish or operate advanced truck stop electrification systems;
- improve transportation systems management and operations that mitigate congestion and improve air quality;
- involve the purchase of integrated, interoperable emergency communications equipment;
- involve the purchase of diesel retrofits that are for motor vehicles or non-road vehicles and non-road engines used in construction projects located in ozone or particulate matter non-attainment or maintenance areas and funded under 23 USC; and
- conduct outreach activities that provide assistance to diesel equipment and vehicle owners and operators regarding the purchase and installation of diesel retrofits.

HIGHWAY SAFETY IMPROVEMENT (HSIP)
The program authorizes a new core federal-aid funding program which began in FY 2006 to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. Each state must have a strategic highway safety plan that identifies and analyzes safety problems and opportunities in order to use HSIP funds. As a condition of obligating HSIP funds, a state is required to submit an annual report to the FHWA describing at least five percent of locations with the most severe safety needs, and an assessment of remedies, costs, and other impediments to solving the problems at each location. The federal share is typically 90 percent. The federal share is 100 percent for certain safety improvements listed in 23 USC 120(c).

METROPOLITAN PLANNING (MP)
The metropolitan planning process establishes a cooperative, continuous, and comprehensive framework for making transportation investment decision in metropolitan areas, like St. Louis. Program oversight is a joint federal Highway Administration/Federal Transit Administration responsibility. The program provides guidance and oversight of MPO planning activities including the Long Range Transportation Plan, Transportation Improvement Plan and Transportation Management Areas. The federal share is 80 percent, subject to the sliding scale adjustment in 23 USC 120(b).

RAIL-HIGHWAY CROSSINGS
The program provides funding to reduce the number of fatalities and injuries at public highway-rail grade crossings through the elimination of hazards and/or the installation/upgrade of protective devices at crossings. Each state is to receive a minimum of a half-percent of the program funds. Fifty percent of each state's apportionment must be set aside for the installation of protective devices at railway-highway crossings. The federal share is 90 percent.

HIGH PRIORITY PROJECTS (HPP)
The program provides designated funding for specific projects identified in SAFETEA-LU. A total of 5,091 projects are identified, each with a specified amount of funding over the five years of SAFETEA-LU. The federal share remains at 80 percent in Missouri and Illinois.

TIGER GRANTS PROGRAMS

The Transportation Investment Generating Economic Recovery, or TIGER Discretionary Grant program, provides an opportunity for the U.S. Department of Transportation (DOT) to invest in road, rail, transit and port projects that promise to achieve critical national or regional objectives. Congress dedicated $1.5 billion for TIGER I, and $600 million for TIGER II, to fund projects that have a significant impact on the Nation, a region or a metropolitan area. DOT is authorized to award $526.944 million in TIGER III Discretionary Grants, which is ongoing at the time of this study. The FY 2011 Continuing Appropriations Act specifies that TIGER Discretionary Grants may be not less than $10 million (except in rural areas) and not greater than $200 million. TIGER's highly competitive process allowed DOT to fund 51 innovative capital projects in TIGER I, and an additional 42 capital projects in TIGER II. TIGER III awards for 2011 were not yet announced at the time of this study. Projects are typically multi-modal, multi-jurisdictional or otherwise challenging to fund through existing programs. Projects also need to meet key program goals including improved sustainability, livability, and economic productivity, in addition to more traditional safety and congestion relief goals. More information can be found at the following link: *http://www.dot.gov/tiger/index.html*

Project Finance Programs

Over the last few decades, Congress and states have looked for new ways to expand the capacity of the federal-aid program to deliver projects as revenues have fallen behind needed infrastructure investment requirements. As a result, states and other project sponsors have available an array of project finance tools to facilitate the delivery of projects and help fill funding gaps. Transportation project finance options available to project sponsors include a selection of bonding programs, including Grant Anticipation Revenue Vehicle (GARVEE) Bonds and Build America Bonds (BABs), as well as State Infrastructure Banks (SIBs). Each of these finance programs are described within the following section.

TAXABLE / TAX-EXEMPT REVENUE BONDS

Public or private entities can issue bonds to pay the cost and expenses of transportation projects. Proceeds of the bonds may only be used for the subject project or as provided in the bond indenture authorizing bond issuance. The bonds can be repaid with any number of revenue sources which will impact the interest rate, required coverage ratio, and overall risk of the debt issuance. Issuers generally try to enhance the credit profile of bond issues by combining revenues (revenue diversification) or backstopping, which means setting up provisions for making debt payments from other sources (general fund or other tax-fed accounts) if the primary revenue collections are less than expected. Bond issues without any backstop or other supplementary revenue support mechanism are often referred to as 'non-recourse debt,' since if revenues are short of expectations, the bond holders have no recourse to collect their principal and interest due from other sources.

Typically, bonds issued by a public agency are tax-exempt, meaning that interest paid to investors is not taxable. Because the interest is not taxable, investors are willing to accept a lower interest rate than would be required for a taxable bond with a similar risk profile. Tax exempt debt is preferable from the issuer's standpoint because they pay less interest and can therefore raise more funds with a given revenue stream.

Taxable bonds are used more frequently in transactions where a private entity is issuing the debt. If private entities cannot somehow qualify for tax exempt debt, they will issue taxable debt or seek direct loans from one or more banks, referred to as 'bank debt.'

BUILD AMERICA BONDS (BABS)

To help generate economic stimulus, Congress enacted the American Recovery and Reinvestment Act of 2009 (ARRA) in February 2009. One provision of ARRA established Build America Bonds, which allow issuers of otherwise tax-exempt bonds to issue taxable bonds in 2009 or 2010 for the same purpose. In return, the U.S. Treasury would pay a subsidy of 35 percent of an issuer's interest expense to compensate for the premium bondholders require for taxable debt. This gives the tax-exempt issuers (mainly states and local government units) access to the larger (and currently healthier) taxable debt market. Bonds had to be issued prior to January 1, 2011 to qualify for the subsidy. At this time, it is unclear if BABs will be extended beyond the January 1, 2011 deadline and continue to be available for state use in the future. Recent press and proposals in 2011 show congressional support growing for the BABs program continuation since it was one of the perceived successes of the economic stimulus program. More information can be found at the following link: *http://www.fhwa.dot.gov/ipd/finance/tools_programs/federal_debt_financing/other_bonding_debt_instruments/build_america.htm*

GRANT ANTICIPATION REVENUE VEHICLE (GARVEE) BONDS

The NHS Act significantly expanded the eligibility of bond and other debt instrument financing costs for federal-aid reimbursement. Since enactment of the NHS Act, a number of states either have issued or are considering project financing that utilizes bond or other debt instrument financing mechanisms involving the payment of future federal-aid highway funds to retire debt. These mechanisms are called Grant Anticipation Revenue Vehicles or "GARVEE" bonds. Some states are designating these financings backed by future federal funds as Grant Anticipation Notes or GANs. The eligibility of a debt financing instrument for reimbursement with future federal-aid, to the extent such funding may be available, does not constitute a commitment, guarantee, or other obligation by the United States

to provide for payment of principal or interest, or create any right of a third party against the Federal Government for payment.

The State of Missouri does allow GARVEE bonds. In 2008, MoDOT sold bonds for a portion of the new Interstate 64 design-build project in the St. Louis region. For the first time, MoDOT secured bonds primarily with federal funds, rather than state funds. More information can be found at the following link: *http://www.fhwa.dot.gov/ipd/finance/tools_programs/federal_debt_financing/garvees/index.htm.*

STATE INFRASTRUCTURE BANK (SIB)

State Infrastructure Banks are revolving loan programs to provide short-term financing to public entities and public-private partnerships for the purpose of accelerating the delivery of transportation projects. The National Highway System Designation Act of 1995 (NHS Act) authorized the creation of a SIB pilot program to provide loans and other credit assistance to public and private entities to carry out highway construction and other transportation projects.

Missouri was among the first ten states authorized to establish SIBs under a pilot program. To expedite the Federal Highway Administration (FHWA) approval process, Missouri created the Missouri Transportation Finance Corporation (MTFC) as a non-profit corporation, which has no employees and reimburses MoDOT for services provided. In 1996, Congress passed supplemental SIB legislation as part of the Department of Transportation fiscal year 1997 Appropriations Act that enabled additional qualified states to participate in the SIB pilot program. This legislation included a $150 million general fund appropriation for SIB capitalization, of which Missouri's SIB received $7.41 million. The Transportation Equity Act for the 21st Century (TEA-21) extended the pilot program for four states, including Missouri; the other states were California, Florida and Rhode Island. More information can be found at the following link: *http://www.fhwa.dot.gov/ipd/finance/tools_programs/federal_credit_assistance/sibs/index.htm*

STATE MULTI-MODAL FUNDING OPTIONS

MoDOT's Multi-Modal Division works with cities, counties and regional authorities to plan improvements for public transit, railroad, aviation, waterway facilities and freight development in Missouri. The Multi-Modal Operations Division performs statewide planning, grant administration, and technical assistance for these modes. In addition, MoDOT does have regulatory responsibility over railroads.

In Missouri, public funding for other modes, for instance rail improvements (the vast majority of rail lines are privately owned), is dependent each year on action by the Missouri Legislature, who must appropriate funds for improvements to MoDOT in each year's budget. The state General Revenue Fund provides approximately one percent of the transportation revenue for the state. The Missouri General Assembly appropriates it for the multi-modal programs. In addition to state general revenue, funding for the state's multi-modal system comes from the following sources:

- aviation fuel taxes;
- 25 cent vehicle registration fees; and
- A portion of new car sales tax.

The programmed State Transportation Improvement Plan (STIP) funding for the multi-modal transportation system varies each year between FY 2011-FY 2016 and is anticipated to range from a low of $140 million in FY 2015-2016 to a high of $310 million in FY 2012-2013. The detailed allocations of STIP funding by mode can be reviewed through the following link: *http://www.modot.org/plansandprojects/construction_program/STIP2012-2016/documents/Sec07_MultimodalOperations.pdf*

One key opportunity within the multi-modal program is the State Transportation Assistance Revolving Fund (STAR). The Commission administers the fund, which assists political subdivisions or not-for-profit organizations in the development of non-highway related transportation facilities. Funds cannot be used for operating expenses or for the construction or maintenance of state highways. The following are the specific eligibility requirements:

- the planning, acquisition, development and construction of facilities for transportation by air, water, rail, freight or mass transit;
- the purchase of vehicles for the transportation of elderly or handicapped persons; or
- the purchase of rolling stock for transit purposes.

The FY 2012-2016 STIP programs $500,000 per year for the STAR program. More about the STAR program can be found at the following link: *http://www.modot.org/partnershipdevelopment/.*

Local Funding Options

There are a range of local funding options available within the state and region which could help the NRCC realize infrastructure improvement benefits that cannot be accomplished without local funding contributions. When transportation infrastructure is built, it often has a positive effect on the local economy. By partnering with the state on infrastructure funding, it allows the opportunity to leverage funds that separately would not have been enough to take on the project. This allows partners to accelerate the time it takes to get a project to completion and can help avoid additional costs due to inflation. Some of the key local funding programs available are described in the following section. More information can be found at the following link: *http://www.modot.org/partnershipdevelopment/*

COMMUNITY IMPROVEMENT DISTRICT (CID)

A CID is a tool used by communities to form (within a specified area) either a not-for-profit corporation or a political subdivision. CIDs can raise revenue via special assessments and taxes to fund transportation infrastructure improvements. The Plan recommends a CID or similar model for infrastructure improvements within the NRCC. A more detailed description and analysis of the CID model is provided in Chapter 2.

NEIGHBORHOOD IMPROVEMENT DISTRICT (NID)

A NID may be created in an area that seeks to build, maintain or improve transportation (as well as other public) infrastructure. These activities are paid for by special tax assessments levied on property owners in the area in which the improvements are made. Projects funded through a NID must be public in nature and be beneficial to property in the NID. NIDS are authorized by a resolution of the governing body of the municipality in which the NID is proposed. NIDs may be appropriate for specific improvements within individual Districts.

TRANSPORTATION DEVELOPMENT DISTRICTS (TDD)

A TDD can be funded through special assessment, real property tax, or sales tax. Funds are used to support transportation improvement projects like signage, road conditions, or other transport-related needs within the districts of the TDD. More information can be found at the following link: *http://www.modot.org/partnershipdevelopment/tdds.htm*

TAX INCREMENT FINANCING (TIF AND SUPER TIF)

Tax Increment Financing (TIF) is an economic development tool which encourages the redevelopment of blighted areas, conservation areas and economic development areas. TIF allows future property taxes generated by a new development to be used to pay for the construction of public infrastructure, site clearance and related project expenses. TIF is based on the premise that there will be an increase in the value of real property, new jobs and other economic activity that will generate new tax revenue to the municipality; and, that these new taxes can be used to enable the desired redevelopment. The new or increased local tax revenues resulting from redevelopment projects in the designated redevelopment area are called the "tax increments". The tax increment from local real property taxes (PILOTS) and 50 percent of the increment from economic activity taxes (EATS) are available to finance eligible project costs, such as the construction of public infrastructure, site clearance and related project expenses.

Missouri State Statutes require TIF projects to meet the "but-for" test: the development would not occur but for the use of TIF. A designated TIF area also must meet one of three designations:

- a finding of blight or blighting conditions in the area; or
- a Conservation Area in the city which 50 percent or more of the structures have an age of 35 years or more and may become blighted because of certain specific conditions; or
- an Economic Development Area which does not meet the requirements for a "Blighted Area" or "Conservation Area", and in which the governing body finds that redevelopment is in the public interest because it will discourage economic development activities from moving to another state; or result in increased employment; or result in preservation or enhancement of the tax base of the city.

Super TIF is a project specific designation given to development already occurring within a TIF district. Whereas a regular TIF district takes a share of local tax revenues, a Super TIF project goes one step further. Super TIFs redirect 100 percent of the property tax increment and 100 percent of the economic activity tax (EAT) increment of the development district. Included in the EAT increment are items like corporate and individual earnings taxes, sales tax for retail and utilities, use taxes, convention and tourism taxes on food and beverage sales, gross receipts taxes and franchise fees. The Briarcliff Development within the Kansas City metropolitan area is an example of a Super TIF. More information can be found at the following link: *http://www.realtor.org/smart_growth.nsf/docfiles/TIFreport.pdf/$FILE/TIFreport.pdf*

ECONOMIC DEVELOPMENT SALES TAX

A relatively new alternative is the Economic Development Sales Tax. This option allows communities to enact a voter-approved tax of up to one-half of one percent tax on retail sales made in the community. These funds can be used for a variety of purposes, including transportation infrastructure.

Public-Private Partnerships

As seen with local funding options, if private industry funding/financing partnerships can be developed, it allows the opportunity to leverage funds that separately would not have been enough to take on the project. This is another way to accelerate the time it takes to get a project to completion. There is a range of private sector funding and financing options available which could help the NRCC realize infrastructure improvement benefits that could not otherwise be realized as quickly or efficiently. MoDOT offers several public-private partnership programs that allow for private industry involvement, including the following:

COST SHARE/ ECONOMIC DEVELOPMENT FUNDING

The purpose of the Cost Share Program is to build partnerships with local entities to pool efforts and resources to deliver state highway and bridge projects. MoDOT allocates Cost Share funds based on the Missouri Highways and Transportation Commission's (Commission) approved funding distribution of which at least $5 million is set-aside for projects that encourage economic development. Eco-

nomic Development set-aside balances in excess of $25 million are available for any Cost Share project. MoDOT participates up to 50 percent of the total project costs on the state highway system. The applicant agrees to provide their share of the total project costs on the state highway system and full funding for any portion of the project not on the state highway system. MoDOT participates up to 100 percent of the total project costs on the state highway system, if the project creates jobs that have been verified by the Department of Economic Development. Retail development projects are not eligible. To qualify for the program, the total project costs must be in excess of $200,000 and the Cost Share funding request cannot be in excess of $20 million and is limited to $5 million per year. In addition, the local MPO must support the project. More information can be found at the following link: *http://www.modot.org/partnershipdevelopment/documents/CostShare.pdf*

COST PARTICIPATION

Sometimes MoDOT works on projects and local entities decide they would like to make some project-related improvements or enhancements at the same time. For this type of situation, MoDOT offers the Cost Participation program. Eligible entities can save on contractor mobilization and other costs by partnering with MoDOT. Project sponsors can coordinate with their local MoDOT District office on these types of projects. More information can be found at the following link: *http://www.modot.org/partnershipdevelopment/documents/CostParticipationProgram.pdf*

MISSOURI TRANSPORTATION FINANCE CORPORATION (MTFC)

Candidate projects for the MTFC assistance include any highway project eligible for federal assistance under Title 23 of the U.S. Code and any transit capital project eligible for federal assistance under Title 49 of the U.S. Code. The MTFC can provide financial support to both public and private sponsors of eligible transportation projects and can assist in financing any stage of the project's development. There are no federal share restrictions on the cost of the projects eligible to receive MTFC assistance. Examples of potential projects could include road and bridge construction, reconstruction, rehabilitation, resurfacing, restoration and operational improvements for highways and bridges, as well as capital projects involving mass or multimodal transportation. The following link provides more detail on specific freight and other multi-modal projects that can also be funded within MTFC: *http://www.modot.org/partnershipdevelopment/documents/MTFCEligbleProjects.pdf*

STATEWIDE TRANSPORTATION ASSISTANCE REVOLVING (STAR) FUND

STAR funds were discussed earlier in this chapter under State Multi-Modal Funding Options. STAR fund provides loans to local entities for non-highway projects such as rail, waterway and air travel infrastructure.

Other Private Options

In addition to the MoDOT partnering programs, there are several other private industry programs or possible emerging funding and financing opportunities that could assist with projects in the NRCC.

PRIVATE ACTIVITY BONDS (PABS)

This financing tool has gained popularity in recent years due to the increase in public-private partnerships. Passage of the private activity bond legislation reflects the Federal Government's desire to increase private sector investment in U.S. transportation infrastructure. Providing private developers and operators with access to tax-exempt interest rates lowers the cost of capital significantly, enhancing investment prospects. Increasing the involvement of private investors in highway and freight projects generates new sources of money, ideas, and efficiency. The designation of a tax- exempt bond as a private activity bond generally occurs if more than 10 percent of the proceeds of the issue are used for any private business use (the "private business use test") and the payment of the principal of or interest on more than 10 percent of the proceeds of the issue is secured by or payable from property used for a private business use (the "private security or payment test"). Interest on private activity bonds (PABs) is not excluded from gross income for federal income tax purposes unless the bonds fall into one of the specific categories of qualified bonds.

The law limits the total amount of such bonds to $15 billion and directs the Secretary of Transportation to allocate this amount among qualified facilities. The $15 billion in exempt facility bonds is not subject to the state volume caps. More information can be found at the following link: *http://www.fhwa.dot.gov/ipd/finance/tools_programs/federal_debt_financing/private_activity_bonds/index.htm*

HIGHWAY INFRASTRUCTURE IMPROVEMENT AGREEMENTS

In 2011, House Bill 1008, sponsored by Rep. Tom Long (R-Battlefield) was introduced. This legislation would authorize the Missouri Highways and Transportation Commission to enter into highway infrastructure agreements to reimburse or repay any funds advanced by or for the benefit of a county, political subdivision, or private entity to expedite state road construction or improvement. This legislation stemmed from a proposed project in the Branson area to develop a race track. At the present time, Governor Nixon has vetoed the bill, but it may still be considered in a Special Session this year. In Governor Nixon's veto letter, he stated that HB 1008 could be interpreted to allow a private entity to finance all or part of a highway project and establish it as a toll road so tolls could be used to repay the private entity.

AMEREN ECONOMIC DEVELOPMENT RIDER

Ameren, the local electricity provider, has created various incentive programs that target infrastructure improvements and increased energy efficiency. The Economic De-

velopment Rider seeks to increase the number of rate-paying customers within areas that already have significant infrastructure.

The Ameren Economic Development Rider for the NRCC is structured to attract or retain larger manufacturers that use an average of 500 kW per month in the NRCC. This program would be best used to attract manufacturing to the Carrie District. However, the program boundary of the Economic Development Rider only extends as far north as East Carrie Avenue. Any changes to the rider requirements must be presented to the Missouri PSC by Ameren, and it would be beneficial for representatives from the NRCC to work with Ameren and the PSC to help form an optimal incentive for the area.

Other incentives include rebates or financing incentives to install or upgrade efficient systems or install solar energy. Most are available to small businesses like retail customers.

STATE ENABLING PUBLIC-PRIVATE PARTNERSHIP LEGISLATION

The State of Missouri is currently drafting potential legislation to allow public-private partnerships to design, build, finance, operate and maintain transportation infrastructure projects within the state. At the current time, this is emerging legislation for the 2012 or 2013 legislative session, but could potentially affect transportation projects within the St. Louis metropolitan area if successfully enacted.

Funding Metrics

Leveraging future funding will be critical to the successful implementation of the Plan vision. The following are performance metrics and required information that will assist in future funding applications for projects identified in the NRCC. The metrics categories area:

- City and Area Wide Job Creation
- Environmental/Green Solutions
- Economic Impact
- Private Investment
- Infrastructure Condition
- Funding/Financing

The Funding Metrics identified in this section taken largely from 22. Federal Register Vol. 74, No. 115, pages 28756-28767 23. Federal Register Vol. 75, No. 121, pages 36246-3625524. Federal Register Vol. 75, No. 155, pages 49017-49020.

City and Area-Wide Job Creation

The applicant shall document how the project will:

- promote job creation (to the extent measurable, provide the number and type of jobs to be created and/or preserved by the project during construction and thereafter);
- benefit existing or new business enterprises during its construction and once it becomes operational;
- create job opportunities for low-income workers through the use of best practice hiring programs and utilization of apprenticeship;
- maximize opportunities for small businesses and disadvantaged business enterprises, including veteran-owned small businesses and service disabled veteran-owned small businesses;
- make effective use of community-based organizations in connecting disadvantaged workers with economic opportunities;
- support entities that have sound track records on labor practices and compliance with Federal laws ensuring that American workers are safe and treated fairly;
- provide a procurement plan that is likely to create follow-on jobs and economic stimulus for manufacturers and suppliers that support the construction industry; and
- create or sustain jobs (both direct and indirect) and attract economic development with an emphasis on long-term job creation.

Environmental/Green Solutions

The applicant shall document how the project will:

- enhance user mobility through the creation of more convenient transportation options for travelers;
- improve existing transportation choices by enhancing points of modal connectivity or by reducing congestion on existing modal assets;
- improve accessibility and transport services for economically disadvantaged populations, non-drivers, senior citizens, and persons with disabilities, or to make goods, commodities, and services more readily available to these groups;
- provide a planning process with coordinated transportation and land use planning and a dedicated community participation process;
- improve energy efficiency reduce dependence on oil and/or reduce greenhouse gas emissions (applicants are encouraged to provide quantitative information regarding expected reductions in emissions of CO2 or fuel consumption, enhance clean energy use or decrease in the movement of goods by less energy efficient vehicles);
- maintain, protect or enhance the environment, as evidenced by its avoidance of adverse environmental impacts;

Environmental/Green Solutions (Continued)

- develop safe, reliable and affordable transportation choices to decrease household transportation costs, reduce energy consumption and dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health;
- expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation;
- benefit the environment (for example, reduce greenhouse gas emissions and oil consumption, increase in recreational areas or open space preserved, etc.); and
- incorporate sustainable practices including developing multi-modal communities, improve connectivity and affordability, enhance access to eduction, decrease transportation costs, attract, improving connectivity to other modes, reducing carbon emissions, promoting alternative transportation, promoting alternative energy, recycling, developing natural stormwater treatment methods, and incorporating low emission fuels during construction.

Economic Impact

The applicant shall document how the project will:

- provide evidence of the long-term economic benefits that are provided by the completed project;
- increase the quality and number of jobs and whether these jobs are expected to provide employment within economically distressed areas;
- identify improvements that allow for net new investments in expansion, hiring, or other growth of private sector production at specific locations, particularly economically distressed areas;
- implement best practices consistent with our nation's civil rights and indicate whether the populations most likely to benefit are from economically distressed areas;
- quantify the project's impact on affordability and accessibility, including the supply of affordable housing units, household transportation costs, or proportion of low- and very-low income households within a 30-minute transit commute of major employment centers;
- improve the area's economic development potential, including maximizing opportunities for infill development or recycled parcels of land or private sector investment along a project or corridor; and
- demonstrate to the satisfaction of DOT that a market exists for the services of the proposed project as evidenced by contracts or written statements of intent from potential customers.

Private Investment

The applicant shall document how the project will:

- establish working partnerships with other entities to get additional resources or commitments to increase the effectiveness of the proposed program activities; and
- leverage other resources from the private sector or other sources committed to the program that exceed the required 20 percent match (resources will be given extra weight for this rating factor).

Infrastructure Condition and Performance

The applicant shall document how the project will:

- be part of, or consistent with, relevant state, local or regional efforts to maintain transportation facilities or systems in a state of good repair;
- rehabilitate, reconstruct or upgrade surface transportation projects that threaten future economic growth and stability due to their poor condition;
- provide quantifiable metrics of the facility or system's current condition and performance and, to the extent possible, projected condition and performance, with an explanation of how the project will improve the facility or system's condition, performance and/or long-term cost structure
- improve long-term efficiency, reliability or cost-competitive in the movement of workers or goods;
- improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets; and
- positively impact travel changes, such as changes in mode share or decrease vehicle miles traveled per capita.

Funding/Financing

The applicant shall document how the project will:

- provide supporting documentation of all committed funds;
- provide a sustainable source of revenue for long-term operations and maintenance of the project (such as up-front capitalization and asset management approaches that optimize its long-term cost structure);
- provide the total amount of funds that will be expended on constructed activities by all of the entities participating in the project;

Funding/Financing (Continued)

- provide a viable finance package including evidence of stable and reliable financial commitments and contingency reserves, as appropriate, and evidence of the grant recipient's ability to manage grants;
- target federal funding toward existing communities—through strategies like transit oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes;
- align to federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy;
- provide a budget proposal that will thoroughly estimate all applicable costs (direct, indirect, and administrative), and be presented in a clear and coherent format (the applicant must thoroughly document and justify all budget categories, costs, and all major tasks, for the applicant, sub-recipients, joint venture participants, or other contributing resources to the project);
- identify available resources including cash or in-kind contributions of services, equipment, or supplies allocated to the proposed program (HUD and DOT's will take into account two considerations: the amount of resources leveraged or matched that exceeds the required 20 percent, and per capita income in the applicable jurisdiction relative to the metropolitan average. The selection criteria will give weighting towards projects that "leverage" funding from sources outside DOT and reduce project maintenance costs);
- reduce external cost and provide public benefit, offer a lower-cost alternative to increasing land-based capacity in the NRCC, and demonstrate the likelihood of financial viability; and
- demonstrate to the satisfaction of DOT that the funds received will be spent efficiently and effectively (preference is given to those projects or components that present the most financially viable transportation services and require the lowest percentage federal share of the costs).

Summary

While all of the funding and financing options outlined within this chapter have potential applicability to the NRCC, it is likely that no one funding/financing source will be able to pay for all needed project implementation costs. With today's limited funding, it will likely take a mix of funding and financing options to deliver the infrastructure improvements proposed for the NRCC. This will include an array of public (federal, state and local) and private industry funding and partnerships. However, knowing and understanding what public and private funding programs are available within the state can provide the St. Louis Development Corporation a head start in identifying potential funding resources as they coordinate further with MoDOT, East-West Gateway Council of Governments, and private industry partners.

4. MARKET ANALYSIS

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4. Market Analysis and Economic Impact

NRCC Market Analysis

This NRCC Market Analysis focuses on the potential for growth within the NRCC. There are two SWOT discussions in this section. The first is based on a review of many previous studies regarding the NRCC as well as studies on river port and industrial development in the St. Louis metropolitan area. The second is based on the personal interviews of NRCC stakeholders. These stakeholders included NRCC business owners, operators, property owners, real estate brokers and developers. Industrial developers and brokers who are not currently working in the area, but who may have an interest in doing so, were also interviewed. Moreover, comments offered at public workshops were also considered in this analysis.

Review of Previous Studies

Previous studies examining the NRCC, various shipping methods, and trends in the shipping and logistics industries provide a wealth of information. Going back to 1977, these reports outline strengths, areas for improvements, possible opportunities, and both regional and global threats.

The St. Louis metropolitan area is at the confluence of two major river systems, has an extensive railroad network, contains two airports with the ability to handle significant air cargo, and is at the intersection of many major highways. The region is known for a low cost of living, multiple cultural institutions, professional sports, and world-class universities and colleges. Because of its historical focus on railways and other modes of transport, St. Louis has more than 60,000 employees in warehousing and distribution. The proximity of multiple modes of transport makes the NRCC very attractive to many businesses including, but not limited to, agriculture, machinery, mining, chemical, and logistics sectors. Existing businesses in the area include manufacturing, wholesale, and scrap yards.

The St. Louis region is known as a shipping leader using various modes of transportation including rail, truck, water, and air freight. Main exports include agricultural products, pharmaceuticals, and machinery. All modes of shipping in the region have seen extensive growth in the past ten years.

Despite the location and amenities offered by both the region and the NRCC, several concerns exist. St. Louis and the NRCC are perceived by many of those outside the area to be in decline, dangerous, and unfit for investment. Labor costs are perceived as high. Many feel that St. Louis City requirements are burdensome and expensive. Infrastructure in the NRCC is generally ill-suited to any significant expansion of industrial or commercial traffic, and rail lines in the area conflict with the existing street grid. Potential NRCC development sites are far too small for substantial industrial development.

Still, many opportunities exist for the St. Louis region and the NRCC. China remains a key importer of goods into the country, and India is slowly building its manufacturing and export capabilities. It is broadly recognized that India will overtake China in the manufacturing of low-value goods in the future and China will focus on the manufacture of high-value goods. St. Louis could take advantage of the shift in trade through various modes of transportation.

Previous studies depict the St. Louis region and NRCC as a good location to capture some of the growing logistics and shipping activities occurring in the Midwest. These activities include inter-modal freight shipping. Due to the presence of multiple transit modes in the immediate area, there is an opportunity to attract multi-modal shipping companies.

The St. Louis region and NRCC must expect considerable pressure from regional, national, and even global competitors. Memphis, Indianapolis, and Kansas City have an established presence in distribution and shipping, including relatively new infrastructure relative to St. Louis. Missouri alone contains multiple public and private river ports, and direct competition exists in the St. Louis metro area at the American's Central Port. A container on barge (COB) port has been developed in Memphis, and others are being planned in Pittsburgh and Cincinnati. Mexico and Canada are preparing for an influx of shipping activity due to the widening of the Panama Canal and may reduce the impact of the canal widening on the region.

Overall, the previous reports indicate that the NRCC is well-positioned to take advantage of the expanding shipping and distribution industry. The area boasts existing transportation infrastructure along with the presence of multiple businesses in various industries. Significant problems exist, namely the outmoded infrastructure, lack of large sites capable of housing modern industrial facilities, and perception of danger.

Previous Studies SWOT Analysis

STRENGTHS

Region: The St. Louis region is centrally located at the confluence of the Mississippi and Missouri Rivers, has an extensive railroad network, contains two airports serving air cargo, and is at the intersection of several major interstate highways. Roadway congestion in the region is generally low. Lambert-St. Louis International Airport has the shortest average flying time to and from the major business centers of North America. The area has approximately 60,000 existing Wholesale Goods employees, and the average wage increase for those employees has been 83 percent of the national average. Cost of living in the region is 89.9 percent of the national average. The area boasts many world-renowned educational institutions that provide strong high-tech and managerial educations suitable for the growing logistics industry.

NRCC: The general study area is located immediately adjacent to the Mississippi River, I-70 and 270, and multiple rail lines, including six Class I rail lines. Many existing port, shipping, and industrial facilities have a strong presence in the area. In short, the NRCC is an excellent location for logistics movements as well as for manufacturing that benefits from and contributes to such movements of goods.

Distribution Centers: The St. Louis region has the third largest rail network in the United States. According to the *Ameren 2010 Competitive Market Analysis* report, the St. Louis Metro is likely to remain an effective distribution point due to its central location, markets served, and distribution networks. St. Louis is a net exporter; the region generates more outbound shipments than it receives inbound shipments. The region ranks 10th highest for originating shipments and 12th for received shipments. Missouri does not tax most inventories, and Illinois is slowly revising its tax code due to the state's fiscal crisis. Most distribution centers can locate in areas with existing air quality problems, such as the areas in the NRCC. The general site has few restrictions on development, and it is assumed that city leaders will work to assemble larger tracts and relocate public rights of way. Depending on site location, tenants may have a view of the Mississippi River or Downtown St. Louis.

WEAKNESSES

Region: St. Louis is perceived as a declining region in terms of population and economic activity. According to the Ameren report, the region has high costs of unionized labor and construction in comparison with labor and construction costs in other Midwestern cities like Indianapolis and Kansas City. Rail service is not provided to many distribution centers in Missouri.

NRCC: The area is perceived by many to be dangerous, and most employees choose to live far from the area. Many businesses considering the area believe that City regulations and MSD requirements are burdensome and expensive. The existing connections to I-70 and surface roads are not designed for commercial activity. Existing railways conflict with the street grid in the area, rendering some vacant land inaccessible. The majority of the area is zoned "K Unrestricted," which allows for undesirable uses such as salvage yards and other "noxious" activities alongside higher value operations.

Distribution Centers: The NRCC suffers from a road infrastructure that is inadequate for heavy truck traffic. Furthermore, existing vacant parcels are scattered among vacant and dilapidated buildings. Distribution Centers typically require sites of at least ten acres with a 1:2 length to width ratio, and the NRCC lacks large, regularly shaped sites. According to the Ameren report, certain activities that produce noxious fumes or particulates, such as existing scrap yards, are detrimental to the sensitive high-tech equipment at modern Distribution Centers.

OPPORTUNITIES

Region: In addition to China, India is making inroads into many manufacturing markets that were once dominated by China. The St. Louis region has a chance to foster relationships with Indian officials for future distribution development. Indeed, the present Aerotropolis initiative centered on Lambert International Airport is intended to broaden this region's international partnerships. The expansion of the Panama and Suez Canals promises to move much of the nation's import activity from the West Coast to the Gulf and East Coasts. This offers St. Louis the opportunity to be a hub of distribution to and from all three coasts as well as to the Great Lakes and Canadian border.

NRCC: The NRCC is located in proximity to three major modes of transportation including low-cost and low-fuel options like barge freight. Many companies today are attempting to lower their fuel costs and simultaneously lower their carbon footprints in efforts to be more environmentally conscious. The City has an opportunity to capitalize on this trend and market NRCC as an ideal location to optimize economic and environmental impact of freight activities.

Multi-Modal Distribution Centers: Although there are some businesses currently in the NRCC, they are not located near each other and vary considerably in their business type. The lack of a dense group of any single type of business activity in the area will not appeal to potential tenants. St. Louis may overcome the 'critical mass' issue by offering substantial incentives to the initial occupants of the site in an effort to attract further business. Sites of at least 10 acres could be created by assembling multiple parcels, demolishing existing dilapidated structures, and developing infrastructure to modern standards.

THREATS

Region: According to previous reports, Missouri is home to 14 public port authorities and over 200 private ports operated along the Missouri and Mississippi rivers. Other ports along the Mississippi and Ohio Rivers are directly competing with St. Louis and include Memphis, Cincinnati, Huntington (WV), and Pittsburgh. Without a high degree of unified management and marketing among regional ports, other regions threaten to out-compete St. Louis.

Existing modern rail and truck inter-modal centers exist in Chicago, Indianapolis, and Kansas City. These relatively close locations require less up-front investment from potential tenants for issues like site remediation, generally have lower construction costs, and are considered 'one-day closer' to the east and west coasts for Indianapolis and Kansas City. St. Louis cannot compete with the developed and mature distribution infrastructure in these three cities.

Canada and Mexico are also improving distribution networks in anticipation of the impact from the Panama Canal and Suez Canal expansions. Much of the anticipated increase in shipping could go to these countries and reduce the impact on the Midwest and St. Louis.

NRCC: Many modern ports are operated in the region including America's Central Port. A water trans-load facility has been proposed for America's Central Port facility and would greatly diminish the ability of St. Louis to introduce a similar service. Jefferson County is in the planning stage for its own port. Existing distribution centers in the region have excess capacity and many greenfield sites are ready for new development. The NRCC will require extensive remediation and other incentives to attract regional tenants.

Stakeholder Review

The most important factor to come out of the stakeholder interviews is that the vast majority of the businesses like their location in the NRCC and anticipate remaining in the area for the long-term. In fact, several of the businesses have explored moving out of the study area with serious consideration for other locations in the area, but chose to remain in the NRCC. Reasons cited for staying included central location within the region, easy access to multiple modes of transportation, and these businesses have had long successful histories in the NRCC.

Other key advantages noted consistently by the stakeholders included the existence of large anchor businesses such as Dial, P&G, and Covidien. These businesses provide stability and also provide the opportunity to attract new and related businesses to the area. The NRCC also provides true multi-modal access for highway, rail, and river transportation, but none of the existing businesses had taken advantage of all three modes of transportation, and most felt that the rail and river were currently underutilized. It was noted that local industrial brokers and developers do not know enough about how businesses utilize (or could utilize) the river to sell these advantages to potential tenants and/or investors.

These businesses also recognized many of the same issues noted by other stakeholders from within and outside the area. Top among these concerns was the difficulty in assembling a site for development or expansion. Existing businesses noted that expansion plans have been delayed or downsized due to the difficulty in acquiring adjacent sites. Other brokers and developers noted that there is steady and continued interest for building and leasing in the area, but the lack of development-ready sites at a competitive cost usually drives these interested parties elsewhere in the region.

The difficulty of building requirements is directly related to site assembly. Most notably, MSD requirements were cited multiple times. Requirements for separated sewer and stormwater lines, as well as large on-site retention areas, drives up costs and land requirements to the point that many new projects are unfeasible. Most site assembly also involves acquiring properties with checkered ownership histories and environmental issues that can be costly to resolve. Although the city government was not seen as a significant obstacle to development, several wondered if more could be done to streamline the development process.

Another common concern among the stakeholders was the overall aesthetics of the area. Some may see these types of issues as a minor concern in a heavily industrial area. However, our discussions with the stakeholders illustrated the very real impact of these concerns on day-to-day operations of existing businesses and the attraction of new businesses to the area. All of the stakeholders noted the old, industrial feel of the NRCC, with conflicting uses located within a small area, a wide variety in the level of property upkeep, aging infrastructure, lack of amenities and lack of attractive signage and entry points. These issues combine to provide a poor first impression of the area, especially in comparison to most of the modern suburban industrial parks that will continue to be the NRCC's primary competition.

Crime also plays a large role in this area of concern. A few stakeholders noted very real concerns of personal and property safety in the area, and have made significant investments in safeguarding their employees and property. Other companies acknowledge crime as an issue, but admitted that they felt the perception of crime was a larger impact for them than actual criminal activity. There is a close relationship between crime and aesthetics, as vacant and poorly maintained properties can attract a criminal element. Crimes and the perception of crime can prevent further investment in the area. This situation results in more difficulty attracting a quality workforce and additional se-

curity expenses to safeguard its existing employees. For brokers and developers trying to attract new businesses and investment to the area, the poor first impression will turn many interested parties toward other options. Some noted that large investors and corporate tenants virtually require Class A industrial environments to insure that such a large investment will be secure over the long-term. This is especially relevant given the continued tight credit market and high lending standards.

Two opportunities on the horizon were viewed favorably by the stakeholders, but some skepticism was also noted. The expansion of the Panama Canal could open the St. Louis market to more distribution opportunities as shippers and distributors seek cost savings by avoiding west coast ports and delivering cargo directly to the Midwest and closer to the densely populated East Coast markets. Some concerns over this potential opportunity include an anticipated rise in the price per container charges at the canal and the fact that West Coast ports are currently operating well below capacity. Both of these factors would negate some of the perceived benefit. To take full advantage of any opportunity presented, both rail and port infrastructure in the study area would need to be significantly upgraded in order to handle a critical mass of container shipment.

The China Trade Hub/Aerotropolis currently in the works would offer other opportunities for the greater St. Louis market, but it was not clear if and how it would directly or significantly impact the NRCC. More likely the benefits would come from the St. Louis area emerging as a major player in the national market for trade and distribution. As a result, the region and NRCC could attract additional interest from larger institutional and international investors that may have previously overlooked the market.

Stakeholder SWOT Analysis

The following analysis summarizes the key points discussed with the stakeholders in the NRCC during the Plan process. Each item is presented as an existing strength that could be built upon, a weakness that would need to be addressed for the area to reach its full potential, an opportunity that could benefit the NRCC, or a threat from external factors or changes in the market that could impede progress being made in the area.

STRENGTHS

Region: The location of St. Louis on the Mississippi River is a unique strength of the area. The river from St. Louis south to New Orleans has no locks – meaning larger tows (40 to 50 barges verses 15 barges) can be accommodated with significantly less expense and downtime. For example, unscheduled lock outages on the Ohio River have increased 10 times over the past several years according to Terry Moore with AEP. Flooding and ice are rarely issues for barge shipping in the St. Louis area and farther south along the river.

The St. Louis market as a whole is relatively stable and does not see the boom and bust cycles typical of many other markets.

NRCC: The NRCC includes several large industrial anchors that provide stability to the area. These businesses also serve as possible demand drivers for the area with potential for suppliers and value added customers to locate nearby. Currently, very few, if any, of these latter types of businesses are located in the area. In addition, AB InBev can be seen as another anchor although it is located in Soulard. The existing facility is largely landlocked, and future expansion of trucking, distribution, or supplier facilities could be located in the NRCC providing near immediate access to the brewery facility.

The NRCC is served by an interstate highway that connects to multiple highways in the Downtown area, multiple railroads, and the Mississippi River, providing multi-modal transportation and distribution opportunities. This combination of transportation options cannot be replicated in green field sites. Access to interstate highways is seen as most important to brokers and developers, with rail and river following. A few stakeholders mentioned that access to multiple modes of transportation can be used to negotiate lower transportation costs even if multiple modes are not utilized. For example, a business could leverage a potential move to rail cargo to bargain with an over-the-road freight provider.

The area is located in near Downtown and centrally located within the region. There were some differing opinions among the stakeholders as to whether this is an advantage or weakness. Positives include possible synergies with corporate offices located in the downtown area, convenient access to multiple highways, and proximity to a variety of dining and recreation venues that could offset the lack of amenities in the NRCC. The main negative mentioned is the relative traffic congestion of the area compared to a suburban or ex-urban industrial park. However, others pointed out that the interstates running through Downtown are no more congested than suburban interstates. Furthermore, the St. Louis area has low traffic congestion and a very good road system overall compared to other major cities.

Lambert-St. Louis International Airport is located west of the NRCC along I-70 and provides a convenient fourth method of transportation to and from the St. Louis region.

Multi-Modal Transportation: The NRCC's multi-modal access and existing large industrial anchors make the area unique to other industrial developments in the region. As a result, it is not directly subject to the boom and bust cycles of green field industrial development. Although the area has a high barrier to entry, this results in large site investments and low turnover, providing an additional buffer against cyclical market trends.

There is an existing nucleus of recent industrial activity along Hall Street. As these pockets of successful development take hold, bigger investors will take notice of opportunities in the area.

The NRCC offers rail access from almost all of the Class I rail operators in the Midwest. However, the rail infrastructure in the area remains largely separate. Each rail company operates their own rails and facilities, and there are few opportunities to transfer between rail carriers. Thus, competition is limited between the carriers.

There is a good spirit of cooperation among some of the larger businesses in the area, even between incompatible users. There is also an existing and active business association–North Broadway Business Association—that can serve more strongly as an advocate and catalyst for proposed changes.

The Riverfront Trail is seen as an asset by many companies in the area. Currently there are no conflicts with trail use, and many companies have taken extra steps to accommodate trail users.

Stakeholders mentioned several regional strengths that could be capitalized upon, including the bio-sciences sector, health care as a high quality service and a growth sector, and an excellent network of colleges and universities. The St. Louis region has been recognized as the top provider of processed foods. Several users are attracted by the quality and availability of water.

WEAKNESSES

Region: Currently the industrial market is overbuilt, with excess supply in the market. Given this oversupply, it is difficult to justify higher rents and thus development in this more expensive area. In a typical market the locational advantage of the site would likely justify a rent premium of $1 per square foot, but there is too much excess supply in the region. One example mentioned multiple times by stakeholders was a supplier to one of the large industrial anchors of the NRCC that located in Hazelwood because they could not justify the higher rent. Low transportation costs and tax abatement at the selected site made development costs comparable, and they chose the suburban location because it was more attractive with no crime concerns.

The St. Louis Region is not growing, as both jobs and population are stagnant, thus it is not clear what is stimulating industrial growth. One broker noted that most of the industrial activity he is seeing is movement of existing companies within the region. Contributing to this issue of little growth is the overall perception of St. Louis as a declining region (population, jobs, declining number of direct flights from Lambert Airport).

Construction costs are higher in St. Louis than in many other Midwestern cities. The higher cost of union labor in the area was mentioned as the primary contributing factor. Kansas City and Indianapolis were cited as examples of competitive industrial markets with lower construction costs.

The industrial market is very prone to boom and bust cycles because construction costs are relatively low and land is cheap for greenfield development. Currently there are no new industrial buildings being built in the market due to existing over supply.

NRCC Sites: There is not enough land for existing tenants to expand, and it is often difficult for new business to find an appropriate site. Although the NRCC contains a large number of vacant and underutilized sites, it is difficult to assemble large, development-ready sites for large industrial users. Multiple small parcels need to be acquired to create a site. Often old buildings need to be demolished, and basements remain even on vacant lots. In many cases utilities need to be rerouted, and environmental contamination must be mitigated. These issues are magnified in an industrial area that requires very large building sites.

Available site dimensions in the NRCC are currently too small for big-box distribution centers. Typically these developments need 500,000 to 1.5 million square feet, 500 to 700 foot deep sites, double loaded, with drop lots for trailers.

Many existing buildings in the NRCC are old and obsolete. As a result they are not leasable to most desirable tenants, such as large warehouse, transportation and distribution companies. A few stakeholders mentioned an abundance of old truck terminals that remain vacant and are no longer viable in the marketplace. These facilities need to be demolished and replaced with modern facilities.

Not all uses can easily be relocated. Many businesses have significant investments in their properties that cannot easily be transferred to a new site. For example, Grossman Iron and Steel recently purchased and installed a $20 million industrial grinder.

The location of railroad tracks makes some excess land unusable for expansion. In many, cases long trains can park on the rails for hours rendering sites located across the tracks inaccessible.

NRCC Development Costs: Development costs in the NRCC are very high due in large part to difficult site assembly and utilities requirements, specifically those of the Metropolitan Sewer District. For example, sites in the NRCC had development costs of $50 per square foot compared to $40 per square foot at the St. Louis Commerce Center site in North City (just north of Downtown) and $35 for a green field site in Illinois. This would equate to $1 per square

foot, or 25 percent premium to create a profitable development.

Building requirements were seen as inconsistent, onerous, and contributing to the higher cost of development. MSD was mentioned as a major contributor to the expense of building in the NRCC. MSD lacks the existing capacity for large users creating significant additional costs for developers. For example, large buildings require their own stormwater detention areas. This drives up the cost of land significantly as more land is needed to develop the same square footage.

This large industrial area is principally served by a residential infrastructure, thus each individual development must shoulder the costs of these significant upgrades.

It was noted that expensive upgrades could be financed over a long period of time through arrangements with the utility companies in the past. However, this option is no longer available, and now developers need to pay for this work up front, making it more difficult to finance projects.

Image and Safety: Due to the poor public infrastructure and a mix of undesirable buildings and uses, the NRCC is largely viewed as a Class C industrial area. The overall "shabby" look of the area pales in comparison to "suburban" industrial parks. Many businesses and properties are not well maintained and contribute to this issue. The existing businesses in the NRCC are spread far apart along the Hall and North Broadway corridors, so there is no continuity. The area lacks a significant concentration of modern industrial facilities that can be built upon as a node of development.

The area lacks attractive amenities and has only a few good quality restaurants, banks, and services. This severely limits the attractiveness of the area to new tenants and investors. With 10,000 workers in the area daily a wider supply of neighborhood amenities should be developed. Businesses that require skilled workers (graduate degrees, high-tech, etc.) find it difficult to recruit these workers due to the unattractiveness of the area (crime, overall look, lack of services).

Class A industrial buildings must be developed in the area to get the rent premiums required to build in the project area. When showing potential tenants, buyers, or investors properties, image is very important to instill confidence in the long-term viability of the area, even if it does not directly affect their day-to-day business operations.

Transportation: The NRCC is bisected by Hall Street and North Broadway Street. This separation results in inefficiencies with transportation within the NRCC and difficult access from outside the NRCC. Both corridors have experienced flooding and drainage issues with serious rains.

The rail facilities in the NRCC do not accommodate the very long trains required by modern distribution facilities. The additional switching costs and time will prevent large container shipping facilities from locating here.

Congestion and road infrastructure may make this a poor location for pure warehousing and distribution facilities. Distribution facilities can accommodate 500 trucks a day, but existing roadways in the area were not designed for this type of use. With multiple facilities in a small area this amount of large truck traffic could prove difficult with trains moving slowly and sometimes stopping, and dock operations at some older facilities conflict with the smooth movement of traffic within the area. Only with careful redevelopment of the existing road infrastructure could the area be truly attractive to distribution facilities.

OPPORTUNITIES

Industry Trends: Distribution and warehousing is increasingly becoming a high-tech industry with more high-paying jobs, more investment in buildings, and more stable tenancy due to the large investment in modern distribution facilities. Many of these buildings are now owned rather than leased. The cost of these developments used to be about $0.50 per square foot, but now it is not unusual to see developments that cost $5.00 per square foot after the installation of technology upgrades such as robotics, tracking, and security.

Currently, the advantages of river access and shipping are not fully understood by investors and brokers. Facilitating improved understanding could yield more opportunities. Higher fuel prices may result in increased demand for multi-modal transportation of goods, with rail and barge becoming more price-competitive over shorter distances. Along with fuel prices, an increased interest in sustainability and "green" thinking may push more companies to consider use of barge and rail options. A 15 barge tow carries an amount equal to 1,500 trucks or 400 train cars.

The expansion of the Panama Canal could provide more opportunities for container shipping.

Transportation and distribution facilities tend to drive other industrial development. By embracing transportation and distribution facilities in the NRCC, the city can enhance the area's overall industrial potential.

Over-dimensional (project) cargo cannot be shipped over highways via trucks, and barges are seen as a more efficient mode of transportation for these items. The number of barge shipments for over-size cargo is increasing, and should be explored as a potential niche market for the St. Louis Port. Such items include large engines, building components, windmill blades, etc.

Trucking may become more expensive with increased emissions regulations and higher gas prices. Furthermore, the Federal Motor Carrier Safety Administration's 2010 Compliance Safety and Accountability Program has the potential to remove 200,000 truck drivers from the road, due to more stringent requirements for commercial licenses

With the increased use of new technologies, barge traffic is becoming more of a just-in-time delivery option. In the past the lack of schedule certainty and timely delivery has limited the potential of river transportation for many manufacturing uses.

Region: The new Mississippi River Bridge will provide an additional route for crossing the Mississippi River with direct access located within the NRCC. This additional bridge will also alleviate some of the congestion on other routes in the downtown area. The NRCC can tout quick access to Illinois and major transportation routes to attract tenants.

One of the biggest competitors for industrial development in recent years consists of new industrial parks located in Illinois. Currently, several factors are making these areas less attractive for industrial development. First, there is concern over the possibility of the levees in the area being de-certified by FEMA. Also, the state recently approved an increase in income taxes, and Illinois levies an inventory tax that does not exist in Missouri. The NRCC might be positioned as an attractive nearby alternative to sites in Illinois.

At this point every industrial development area in the region has issues of concern. Instead of being the only area with disadvantages, The NRCC is on equal footing with most developments in the area.

NRCC Sites: A local industrial developer currently owns 143 acres of land and has identified another 200 to 300 acres that could be acquired near the Adelaide Street corridor. Combined, this could serve as a consolidated node of modern industrial development and convince tenants to locate in the area.

A modern container facility needs the ability to accommodate 8,000 foot trains. The land exists in the NRCC, but it is not currently configured to accommodate trains of this length. This is a requirement to facilitate container shipping. The City has an opportunity to consolidate land to attract new tenants.

Incentives and Other Developments: The proposed Northside Development on the west side of I-70 is attracting the notice of institutional investors to the area. This could bring increased attention to the NRCC, and the City should ensure that the area is well-marketed. The proposed Chinese Hub/Aerotropolis initiative could present additional business opportunities. Although many of these may be located closer in proximity to the Airport, the NRCC is included in the defined zone and incentives will be available. Interest in the area generated by the initiative could also result in a higher regional profile from large foreign investors.

The development area is located in an Enterprise Zone and the Aerotropolis development incentive area. The availability of these incentives plus the possibility of additional incentives from the city and Federal Government could drive down the cost of development, which is currently seen as cost prohibitive by most potential developers.

The NRCC has not tapped into the institutional investment market, instead largely depending on local investors. In most cases these smaller investors do not have enough capital to make big changes. Large institutional investors are looking for excellent highway access, attractiveness and curb-appeal, the availability of large parcels and sites, and a long-term vision. If these issues can be addressed a larger pool of investors will be interested in development in the NRCC.

The unique multi-model opportunities offered in the area are well suited for user-driven development, as opposed to speculative development. Therefore, the area will be more immune to market fluctuation, and future users could be less cost conscious.

THREATS

Regional Competition: Politics of competing developments is a looming issue. A few developers felt that the city needs to pick its area of focus. Otherwise there will be competition within the city itself between the NRCC and the proposed Northside development and any other potential industrial development sites being promoted. Developers will not look favorably if the city supports industrial development in this area, and then subsidizes additional competing developments in other areas. Given the current oversupply in the market, there is not enough development or tenants to fill multiple large-scale projects, and the lack of focus will scare off investors, developers and tenants.

The St. Louis region has an existing large inventory of unoccupied industrial warehouse space, and many developments have large areas of available land for future development. There is some concern that new riverfront industrial activity is moving south of St. Louis to avoid the multiple bridges in the Downtown area.

There is existing and planned future competition from other river ports in the area. In addition to America's Central Port, Jefferson County is planning a modern port facility. St. Louis needs to find and establish a niche within this competitive environment to compete effectively.

Competition from other cities is strong. Indianapolis and Kansas City are far ahead of St. Louis in multi-modal industries. With east-west shipping driving the industry, each

Economic Trends and Forces Affecting NRCC Development

ST. LOUIS INDUSTRIAL MARKET OVERVIEW

The St. Louis industrial market includes space for warehousing, distribution, and manufacturing. The regional, bi-state market in the metropolitan area includes 268.5 million square feet of such space and has a vacancy rate of 7.7 percent, about two percentage points below the national average. This also marks significant improvement over the vacancy rates of 10.2 percent one year ago (Q1 2010), which was close to a ten-year high for the market.

The construction of industrial space boomed from 1997 to 2001 in metro St. Louis with almost 48 million square feet of space added to the market. This pace of development had not been seen for almost three decades. Unfortunately, occupancy or absorption did not keep pace so this large increase of space also increased vacancy from four to over nine percent in just two years (2000 to 2002). After that period of expansion, deliveries of new space have slowed, allowing space to be absorbed into the market with reductions in overall vacancy rates. As a result, vacancy stabilized around seven percent. However, from 2006 to 2008 almost another 11 million square feet of space was added to the market just prior to the national recession. At that time, vacancy increased from 6.7 percent in Q1 2006 to 10.4 percent in Q3 2009.

Less than a million square feet of new deliveries have been added to the market in the last two and a half years, the lowest level of new industrial construction since World War II. During this time, over 6.6 million square feet of older space was removed from the market. A combination of reduced construction, removal of space, and the slow economic recovery has the vacancy rate again moving closer to a stabilized rate of seven percent. As of Q1 2011, there is less than 25,000 square feet of space currently under construction in the region. This compares to a quarterly average of 2.25 million square feet of space under construction from 2000 to 2009.

Prior to the stall of industrial construction, the most active submarkets included North St. Louis, Airport, and Metro East. In fact, construction in the Metro East accounted for almost half of the additional space added in the region from 2006 through 2008.

Rents for industrial space have fluctuated within the $3.70 to $4.50 per square foot per year range since 2000, closely following trends in the national economy. The current average asking lease rate for industrial space is $3.78 per square foot in the region. Long-term trends since 2000 show that lease rates have been stagnant due in large part to the growth in inventory and increase in vacancy rates. If the building of industrial space continues to remain slow, occupancy rates will continue to increase and lease rates will likely start to trend upward. In turn, this will spur further development as the market expands.

INDUSTRIAL SUPPLY

The major industrial base of the City of St. Louis is located within the NRCC. According to CoStar, the NRCC contains 289 industrial properties with over 13.9 million square feet of space, which is 91 percent occupied. The average rent for the study area is $3.31 per square foot. This is below the regional average, due the age and below average condition of the space; the majority of these properties were built prior to 1960. Only 11 properties, accounting for 8.6 percent of the rentable building area (RBA) in the NRCC, were built or substantially renovated in the past two decades. Currently, however, these properties are only 46 percent occupied with an average lease rate of $3.76.

The larger North St. Louis Industrial submarket includes almost 800 properties and 47,000,000 square feet of RBA. The submarket is currently 92.5 percent occupied.

Three of the most recently constructed or significantly renovated properties located in the study area are summarized on the following page.

Address: 6501 Hall Street
Name: St. Louis Business Center
Tenants: Not Available
Leasable Area: 163,490 square feet
Occupancy: 25 percent
Quoted Rate: $4.23
Delivery Date: Renovated 2008, built 1968
Comments: Significant renovation brought building up to modern industrial standards

Address: 8000 Hall Street
Name: St. Louis Business Center, Building 1
Tenants: New Era, Arlo Steel
Leasable Area: 364,438 square feet
Leased: 97 percent
Quoted Rate: $5.00
Delivery Date: Renovated 2005, built 1951
Comments: Significant renovation brought building up to modern industrial standards

Address: 6500 Prescott Street
Name: North Broadway Distribution Center
Tenants: International Food Products
Leasable Area: 420,000 square feet
Leased: 29 percent
Quoted Rate: $3.50
Delivery Date: Built 2008
Comments: Significant renovation brought building up to modern industrial standards

The low occupancy of the newly developed or renovated buildings in the NRCC is largely indicative of the national recession and overabundance of industrial space currently in the market due to the building boom of the late 1990s through middle 2000s. Note that the property completed in 2005 is fully occupied, while the two completed at the beginning of the recession are less than 50 percent occupied. The entire St. Louis Business Center is just 73 percent occupied.

The greater St. Louis industrial market includes eight large-scale master planned industrial developments largely built since 1990, though some have been planned for longer. The modern industrial, warehouse, and distribution space located within these developments will be competitive with newer developments currently located within the NRCC as well as the types of uses envisioned for the area in the future. Most of these developments include over a million square feet of RBA; however, we have included three smaller developments. St. Louis Commerce Center is located in North St. Louis, but outside the study area. North Park and Premier 370 are planned industrial parks with over 500 acres of land including development-ready sites, but neither has seen significant build-out to this point. These developments are summarized in the table on the following page.

Summary of Competitive Industrial Development Areas

Name	Submarket	Location	Total RBA	Current Occupancy	Lease Rate
Gateway Commerce Center	Metro East	I-270/I-255	9,448,896 SF	89%	$3.64
Earth City	North County	I-70/Earth City Exp	9,352,294 SF	81%	$3.49
The Fountains	St. Charles County	MO 370/New Town Blvd	1,995,675 SF	95%	$3.21
Park 370	North County	MO 370/St. Louis Mills	1,839,258 SF	66%	$3.92
West 70 Commerce Center	St. Charles County	I-70/Salt Lick Rd	1,386,922 SF	100%	N/A
St. Louis Commerce Center	St. Louis City	N Jefferson/MLK Dr	487,000 SF	89%	$4.33
North Park*	North County	I-70/North Hanley Rd	121,253 SF	44%	$5.95
Premier 370**	St. Charles County	MO 370/Truman Rd	30,000 SF	100%	N/A
Total/Average			**24,661,298 SF**	**85%**	**$3.59**

* 550 acres planned for development, marketing began in 2006

** 829 acres planned for development, marketing began in 2008

Table 1.1 - Summary of Competitive Industrial Development Areas

Overall occupancy of these developments is below the regional average due in large part to large amounts of speculative warehouse and distribution space. The low rate is also indicative of the recent recession. For example, Earth City has the largest amount of vacant space in the region. As recently as Q3 2008, occupancy of the Earth City area was 94 percent and has dropped consistently since then to its current rate of 81 percent – its lowest occupancy rate since the recession of the early 2000s. The largest, Gateway Commerce Center, delivered its first building in 1998 and eclipsed the previously well established Earth City after just about 10 years of development. The success of Gateway Commerce Center attracted some large tenants away from older developments in the area, including those listed, resulting in lower overall occupancy for modern industrial facilities in the region.

Overall, the boom in industrial supply over the last two decades has outpaced demand for new space. Only now with a virtual halt in new construction and deliveries are occupancies beginning to return to levels in the low to mid 90 percent range.

INDUSTRIAL SPACE DEMAND

Despite the slow pace of construction, the market has seen an increase in space of 2.8 percent over the past five years, compared to a 5.8 percent decline in overall employment. The 8.6 percent gap between these figures indicates that the growth of industrial space will remain slow until the national and local economies begin to see a more substantial recovery in terms of new jobs and reductions in unemployment. Although the gap is large, it is similar to markets such as Denver (8.0 percent) and Chicago (8.7 percent). This suggests that construction may continue to slow or that vacancies will rise as new space enters the market. *Table 1.2* summarizes the newly delivered and absorbed industrial space for submarket clusters within the St. Louis region. Typically, this table would include the amount of space under construction, but currently there is less than 25,000 square feet of RBA under construction in the entire region.

Absorption Indicators by Submarket Cluster

Submarket Cluster	Q2 '10 - Q1 '11 Absorption	Q2 '09 - Q1 '10 Absorption	5-Year RBA Delivered
St. Louis City	(790,456) SF	(283,096) SF	772,138 SF
Central County	(28,922) SF	156,707 SF	141,298 SF
North County	808,813 SF	(332,763) SF	1,691,470 SF
South County*	44,692 SF	(4,867,129) SF	1,112,303 SF
West County	162,932 SF	(74,620) SF	369,222 SF
St. Charles County	1,635 SF	(108,987) SF	544,190 SF
Metro East	865,229 SF	479,311 SF	5,018,450 SF
St. Louis Region*	**1,253,432 SF**	**(5,165,277) SF**	**9,767,421 SF**

* Includes closure of Chrysler plant in Q3 2009, ~5MM sf

Table 1.2 - Absorption Indicators by Submarket Cluster

The dramatic negative absorption seen in 2009 is due primarily to the closing of the Chrysler plants in Fenton, Missouri*. Absent this large closure, the overall market showed a net zero absorption. In the prior year, regional absorption was about negative 1,000,000 square feet. So, the market has seen gradual improvement over the past three years. Unfortunately, the St. Louis City submarket saw significant negative absorption over the past year, and an increase in negative absorption over the prior year.

The large industrial development areas discussed earlier also provide good indicators of potential absorption for large-scale, modern industrial facilities. Ideally, modern facilities developed in the NRCC will be competitive with these types of developments. The NRCC does have the advantage of available river access, and the new Mississippi River Bridge will enhance access and reduce congestion. However, many issues identified in the SWOT analysis remain, most notably site assembly. Thus, the NRCC will be at a competitive disadvantage to these sites, many of which have pad ready sites available.

The following table compares the primary years of development (contiguous years in which 80 percent or more of the RBA for the area was delivered) between 1990 and 2011. The amount of delivered RBA is divided by the number of years to determine the annual absorption rate.

These industrial developments had a combined annual delivery of over one million square feet over the 21-year development period. However, most of this development occurred within the first 16 years from 1990 to 2006. The two most recent developments have only seen delivery of about 30,000 square feet per year. On the other hand, Gateway Commerce Center has seen unparalleled growth. Since 2000, it alone accounts for 25 percent of the delivered RBA in the region and 71 percent of net positive absorption. A few tenants at Gateway Commerce Center, in fact, include warehouse and distribution facilities for manufacturing operations of companies currently located in the NRCC including Dial and Procter & Gamble. Gateway development capitalized on an abundance of low cost land with ideal highway access and generous development incentives, as well as favorable markets.

* *Both of those plants are being removed from the inventory of the region. The South Plant was demolished in late 2010. Removal of the North Plant is underway.*

Summary of Competitive Industrial Development Areas

Name	Submarket	Primary RBA	Primary Development Begins	Primary Development Ends	Dev. Period (Years)	RBA Delivered per Year
Gateway Commerce Center	Metro East	9,383,896 SF	1998	2008	11	853,000 SF
Earth City	North County	8,646,279 SF	1990	2003	14	618,000 SF
The Fountains	St. Charles County	1,440,943 SF	1998	2001	4	360,000 SF
Park 370	North County	1,580,958 SF	2001	2006	6	263,000 SF
West 70 Commerce Center	St. Charles County	1,386,922 SF	1990	1998	9	154,000 SF
St. Louis Commerce Center	St. Louis City	487,000 SF	1999	2002	4	122,000 SF
North Park*	North County	121,253 SF	2008	2011	4	30,000 SF
Premier 370**	St. Charles County	30,000 SF	2011	2011	1	30,000 SF
Total/Average		**23,077,251 SF**	**1990**	**2011**	**22**	**1,049,000 SF**

* 550 acres planned for development, marketing began in 2006

** 829 acres planned for development, marketing began in 2008

Table 1.3 - Summary of Competitive Industrial Development Areas

The next table compares the absorption rates of seven industrial geographic submarkets in the St. Louis region between 1990 and 2011. These submarkets do not include outlying "collar counties" that are considered part of the St. Louis metro area, so the metropolitan total is not a sum of the submarkets shown on the table. The table shows the average annual absorption of space since 2000 and the average annual absorption for the best five-year period for each submarket. Also drawn is a comparison of the amount of new industrial space added to each submarket regardless of absorption.

Absorption Indicators by Submarket Cluster (2000 - 2011)

Submarket Cluster	Net Absorption Best 5-years, Ann. Avg.	Net Absorption 11-year, Ann. Avg.	RBA Delivered Best 5-years, Ann. Avg.	RBA Delivered 11-year, Ann. Avg.
St. Louis City	140,367 SF	(370,270) SF	187,455 SF	161,414 SF
Central County	145,212 SF	(124,572) SF	265,754 SF	142,103 SF
North County	602,287 SF	259,226 SF	667,057 SF	540,769 SF
South County	617,233 SF	(214,477) SF	370,547 SF	283,995 SF
West County	174,726 SF	55,220 SF	189,387 SF	109,284 SF
St. Charles County	557,555 SF	301,233 SF	652,883 SF	363,287 SF
Metro East	1,519,160 SF	1,042,443 SF	1,767,770 SF	1,087,799 SF
St. Louis Region	**3,180,742 SF**	**1,000,393 SF**	**3,764,965 SF**	**2,832,248 SF**
St. Louis Region (1990-2011)			**8,818,829 SF**	**4,508,536 SF**

Table 1.4 - *Summary of Competitive Industrial Development Areas*

The table illustrates that, although there was a period of strong expansion over the past 11 years, it was well below the average of the past two decades. The period from 1990 to 1999 saw significantly more growth, averaging 6.7 million additional square feet annually. The average annual delivery over the past 21 years, 4.5 million square feet, provides a good long-term indicator of industrial growth potential. It includes several business cycles. The scale of expansion seen in the 1990s will not likely be seen again, but that is balanced with the almost complete lack of development seen over the past three years. Overall, the if is estimated that on-going industrial development in the region will continue to add an average of 3.8 million square feet of space annually. This is a lower projection than in the past, but accounts for existing vacant space in modern industrial buildings that must be absorbed. Nevertheless, absorption will not keep pace as older obsolete buildings are vacated in favor of new space more suited for modern manufacturing, warehousing and distribution processes. At this pace, it is estimated that the inventory of development-ready sites located in the large industrial areas identified would take about six years to be absorbed if all new development located in these areas. Accounting for a reasonable capture rate of 35 percent, the inventory of existing sites would be absorbed in 16 years.

The Metro East submarket has been dominant over the past 11 years, accounting for over 100 percent of the region's net absorption and 38 percent of total deliveries. These means that, on average, the rest of the region (effectively the Missouri side) has experienced net negative absorption. The St. Louis City submarket has seen net negative absorption of over 370,000 square feet per year, indicating that much of its space is perceived as obsolete and tenants are looking elsewhere in the region for industrial space. Moreover, efforts to modernize the city's inventory of industrial space lags well behind submarkets such as the Metro East, North County, South County, and St. Charles County. New industrial space in the city accounts for 5.7 percent of total space added.

[*] *Even this period of expansion does not match the sustained growth seen from the mid-1960s through the 1970s. However, that level of industrial growth has passed with the de-industrialization of the national economy.*

RECOMMENDED DEVELOPMENT PROGRAM

This analysis includes two scenarios of industrial space additions that could play out in the future in the NRCC: a limited scenario and a full scenario. The limited scenario assumes some substantial improvements are made to the NRCC including:

- improved access with the new Mississippi River Bridge;
- upgrades to the area's infrastructure;
- aggressive and collective marketing and branding of the area;
- improved land assembly for developers, but no sites pre-assembled and made shovel-ready for industrial development;
- new amenities including but not limited to wayfinding signage, streetscape and landscape enhancements;
- modest upgrades to area services, including a handful of new businesses catering to employees in the area such as restaurants, service stations, and banks; and
- traditional development incentives such as ten-year tax abatement are offered to new industrial developments

However, in this limited scenario:

- China Hub/Aerotropolis either does not come to fruition or has minimal impact on the regional industrial market outside a few select developments;
- little to no impact is felt in the region from the expansion of the Panama Canal;
- no major investment (public or private) is made to substantially upgrade the area as a super regional or national multi-modal hub. This would include a regular and robust use of rail and barge transportation for new forms of cargo such as container shipments.

As a result of these changes, new industrial development within the area will meet and exceed the annual delivery for newly built industrial space over the past 21 years. Thus, we have added a performance factor of 1.25, or a 25 percent increase in the capture rate of regional industrial growth. It is assumed that all new industrial development will occur in newly improved and targeted areas within the city including the NRCC as well as the Northside industrial development area (McKee). As a result, the new space will be allocated evenly between the two developments. In absence of the Northisde development, it is reasonable to assume that the NRCC would still not capture all of the new industrial development in the submarket, but a 50 percent capture rate still applies. This annual average calculation is summarized in the *Table 1.5*.

Projected Build-out (Limited Scenario)	
Regional Industrial Deliveries	3,800,000 SF
St. Louis City Submarket Capture Rate	5.70%
Performance Factor	1.25
Adjusted Capture Rate	7.13%
St. Louis City New Industrial Space	270,750 SF
Project Capture Rate	50%
North Riverfront Annual Build-out	**135,000 SF**
25-year Total Build-Out	**3,375,000 SF**

Table 1.5 - Project Build-Out (Limited Scenario)

The full scenario estimate assumes more significant improvements are made to the NRCC and an improved regional industrial market campaign, including:

- improved access with the new Mississippi River Bridge;
- substantial upgrades to the area infrastructure;
- aggressive and collective marketing and branding of the area;
- conflicting uses and substandard properties are removed from targeted development areas;
- master developer(s) in place with multiple pre-assembled sites, shovel-ready for industrial development;
- improvements such as wayfinding signage, landscape, streetscape and enhanced gateways;
- upgrades to area services, including a concentration of new businesses catering to employees in the area such as restaurants, service stations, and banks; as restaurants, service stations and banks;
- new development incentives are offered along with traditional incentives;
- China Hub/Aerotropolis has noticeable impact on the regional industrial market including St. Louis and NRCC;
- expansion of the Panama Canal leads to increased demand for multi-modal transportation facilities including inland ports; and
- major investment (public or private) is made to upgrade the area with the infrastructure required to support regular and robust use of rail and barge transportation for new forms of cargo creating a super regional or national multi modal hub.

As a result of these changes, which do not seem out of reach, new industrial development within the overall St. Louis area will far exceed the annual delivery for newly built industrial space over the past 21 years. Thus, we have added a performance factor of 1.1 for the overall region due to changes in the marketplace, a ten percent increase over our estimated annual deliveries. Moreover, the City's performance factor is increased to 2.0 indicating that the city submarket doubles its existing capture rate of regional industrial growth.

Again, we assume that all new industrial development will occur in newly improved and targeted areas within the city including the NRCC as well as the Northside industrial development area (McKee). In this scenario, however, the NRCC's access to the river and port as well as other improvements increase its local capture to 60 percent. This calculation is summarized in the following table.

Projected Build-out (Full Scenario)	
Regional Industrial Deliveries	3,800,000 SF
Regional Performance Factor	1.1
Adjusted Industrial Deliveries	4,180,000 SF
St. Louis City Submarket Capture Rate	5.70%
Performance Factor	2.00
Adjusted Capture Rate	11.40%
St. Louis City New Industrial Space	476,520 SF
Project Capture Rate	60%
North Riverfront Annual Build-out	**286,000 SF**
25-year Total Build-Out	**7,150,000 SF**

Table 1.6 - Project Build-Out (Full Scenario)

Our build-out scenarios include delivery of 135,000 square feet annually in a limited scenario which includes significant improvements to the NRCC. A shift in the regional market and transformation of the NRCC with large areas competitive with modern industrial parks would yield more than twice the growth, with a projected potential annual build out of 286,000 square feet annually.

These projections are compared to other large regional developments on the following graph.

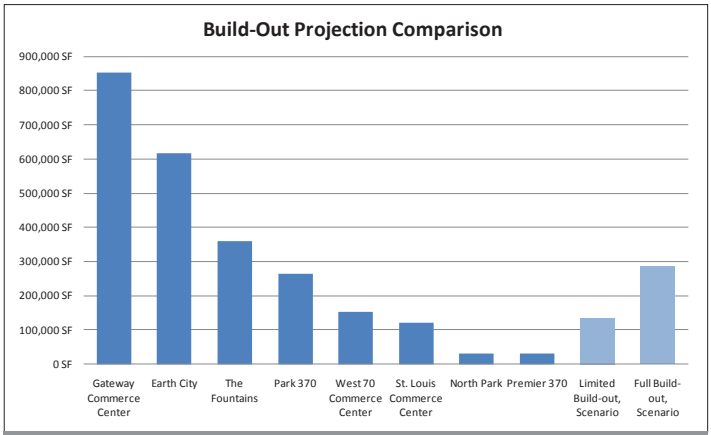

Figure 1.1 - Project Build-Out Projection Comparison

This comparison suggests that the industrial space absorption projections are reasonable when compared to the performance of modern industrial parks developed in the region over the past 20 years. The limited build-out scenario falls at the low end of the range, but would be similar to the St. Louis Commerce Center, also located in North St. Louis. We envision, however, a larger total build-out over a longer period of time for the NRCC. Also note the average deliveries in the NRCC over the past five years has averaged 93,000 square feet annually. However, in the prior 20-years deliveries have averaged less than 5,000 square feet annually.

The full build-out scenario is comparable to the middle range of the surveyed industrial areas. Although the NRCC would be very attractive in this scenario, it would still be constrained by the size and availability of properties to match the expansion of Gateway Commerce Center. Earth City was developed though a sustained period of strong industrial expansion in the 1990s.

The following table shows the build-out projections for each scenario over a period of 25 years along with estimates of land requirements using a floor-area ratio of 0.36 based on the average floor area ratios of the competitive industrial areas built since 1990*.

** A floor area ratio (FAR) is the ratio of square feet of a building to the square feet of its lot or site. A FAR of 0.36, therefore, means that the floor area of the building will total 36 percent of the land area. If it is a one-story building, it would occupy 36 percent of the site. The remainder of the site would be used for parking, loading, landscaping, etc.*

North Riverfront Industrial Projected Build-Out

	Limited Scenario		Full Scenario	
Years	*SF*	*Acres*	*SF*	*Acres*
1	135,000	9	286,000	18
2	270,000	17	572,000	37
3	405,000	26	858,000	55
4	540,000	35	1,144,000	74
5	675,000	43	1,430,000	92
6	810,000	52	1,716,000	110
7	945,000	61	2,002,000	129
8	1,080,000	69	2,288,000	147
9	1,215,000	78	2,574,000	166
10	1,350,000	87	2,860,000	184
11	1,485,000	96	3,146,000	202
12	1,620,000	104	3,432,000	221
13	1,755,000	113	3,718,000	239
14	1,890,000	122	4,004,000	258
15	2,025,000	130	4,290,000	276
16	2,160,000	139	4,576,000	294
17	2,295,000	148	4,862,000	313
18	2,430,000	156	5,148,000	331
19	2,565,000	165	5,434,000	350
20	2,700,000	174	5,720,000	368
21	2,835,000	182	6,006,000	386
22	2,970,000	191	6,292,000	405
23	3,105,000	200	6,578,000	423
24	3,240,000	208	6,864,000	442
25	3,375,000	217	7,150,000	460

Table 1.7 - NRCC Project Build-Out

Initial indications are that the 3,000 acre NRCC includes about 1,000 acres of vacant or underutilized parcels that could possibly be utilized as industrial sites. In a 25-year development window, both scenarios would fit within this threshold. Furthermore, both scenarios would make a substantial impact on the NRCC, especially if the new industrial space was concentrated in just a few targeted areas.

The size of development sites required will be dictated by the size of newly developed buildings and concentrations of multiple buildings in identifiable industrial development areas. Stakeholders suggested the most efficient and successful big-box distribution buildings would require 500,000 to 1,500,000 square feet in size with depths of 500 to 700 feet deep, and include trailer drop lots. These are similar to the specs of newly developed industrial buildings in Gateway Commerce Center. However, there was some concern among stakeholders that the largest buildings would not be appropriate for the NRCC. Developers and tenants of these largest buildings tend to seek suburban and ex-urban sites to avoid congestion in the region's core. It is also unclear if the subject area could handle the amount of tractor trailer traffic generated by multiple buildings at the high-end of the indicated range. Furthermore, build-to-suit facilities may not require such large footprints. As a result, we do not anticipate buildings over 1,000,000 square feet. The most recently constructed (2008) industrial building in the NRCC was 420,000 square feet in size with a land area of 20.36 acres, or a floor area ratio of 0.47. The floor area ratio of the most recently developed large industrial area is Gateway Commerce Center is 0.44. Thus, individual building sites could range from 20 to 50 acres.

Later we recommend that multiple industrial buildings should be concentrated in a "small" area to capitalize on management and development synergies, as well as to create an attractive and consistent environment similar to a suburban industrial park. Based on our discussions and other industrial development areas in the region, the smallest concentration of development able to achieve these synergies would likely be four large buildings. That would equate to a total development site of least 100 acres. Multiple industrial concentrations could be located throughout the study area, and not every new development would need to be located in a defined industrial concentration. Note that the average size of the competitive industrial development areas surveyed was 383 acres.

EXPECTED KINDS OF INDUSTRIAL USES

The NRCC already contains a wide array of business types, land uses, and economic sectors. Review of the literature and interviews with stakeholders strongly indicates that a prediction of particular types of businesses or sectors in the study area over the next 25 years is a valueless exercise. Instead, the area should continue to be positioned to attract and support a wide range of land and building uses.

In an effort to nevertheless provide a broad indicator of uses, a six-year database on business park developments in the Midwest United States was evaluated. While the data was analyzed by the project team, the source of the underlying information is obtained monthly from Conway Data, based in Atlanta, Georgia. Conway compiles development information for the entire U.S., though this analysis relies only on the trends taking place in the Midwest. The time frame of the information is January 2005 through March 2011.

The key indicator is depicted on the following graph. It illustrates a rough weighted analysis of six characteristics of buildings developed in the industrial sectors shown on the left axis. The actual database includes information on many more sectors, but the illustrated land uses are those most likely to be attracted to the NRCC*.

The six characteristics are:

- dollar investment in building construction;
- number of acres of land required;
- employees;
- employees per square foot;
- building size; and
- the overall count of buildings by sector.

The 31 shown sectors were ranked for each characteristic, with higher numbers assigned to higher ranks. The graph depicts the sum of the ranking points.

In effect, the data show that buildings for wholesalers of durable goods are the most likely real estate "product" to expect in the NRCC. But manufacturers in the metal sectors and wholesalers in non-durable goods also rank quite highly. For the most part, these leading sectors also have a major presence in the NRCC today. While the fourth ranking sector, transportation equipment manufacturing, has substantially declined in greater St. Louis, the next sectors of truck transportation, electrical machinery manufacturing, chemical manufacturing, and warehousing & storage already have a strong base in St. Louis and, for the most part, in the NRCC. Therefore, catering future improvements in the NRCC to sectors that are already strong in St. Louis and that are already strong in the NRCC is likely to be the most lucrative marketing strategy.

* *For instance, the Conway Data show characteristics for retail stores, restaurants, hotels, and a great many uses that are typically in office buildings. While some of these uses well be appropriate also in the NRCC, it was deemed most useful to concentrate on industrial sectors which in turn, can help support non-industrial sectors when demand is demonstrated.*

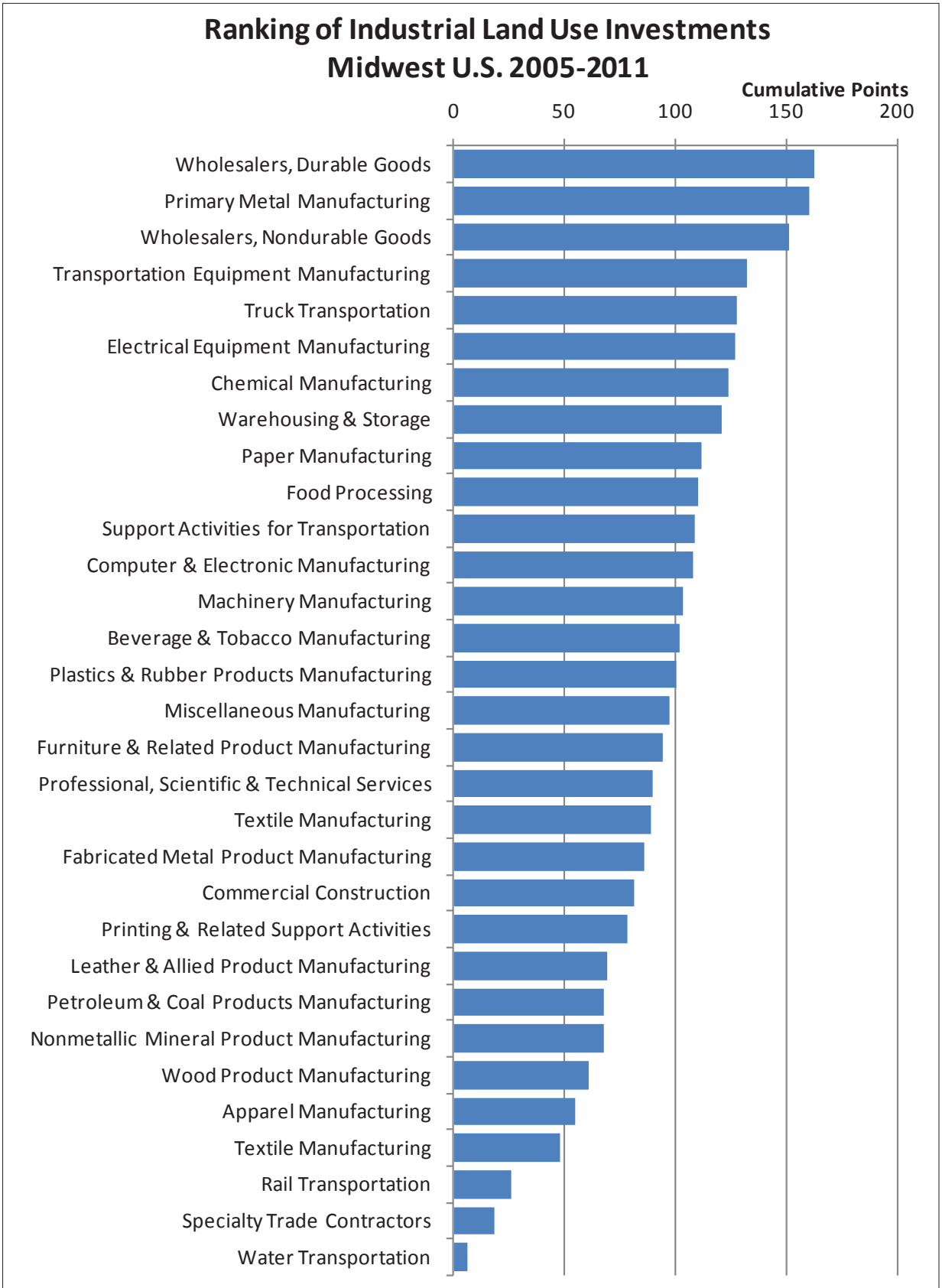

Figure 1.2- Ranking of Industrial Land Use Investments- Midwest U.S. 2005-2011

Market-Based Recommendations

Several significant themes regarding future development potential of the NRCC emerge from the preceding analysis. In turn, these themes suggest a number of action items for the pursuit of market-driven development improvements. Of necessity, however, these action items cannot be solely reliant on private market forces. Most or all will require public-private partnerships to achieve realistic goals.

Trucking clearly is the driving force in capitalizing on the NRCC's strengths and opportunities. While rail and river transport are tremendous assets that can and should be exploited further, it is the transportation flexibility of trucks around which improvement of the NRCC should focus. Overly narrow streets, poorly maintained road surfaces, freight train blockages, inadequate parking areas, inadequate queuing areas, and on-street loading areas contribute to a poor environment for the vital operation of trucks. Trucks serve all sectors in the NRCC and also need enhanced, speedy access to the interstate highway system.

In effect, inter-modal transport opportunities in the NRCC are controlled by the ability to load, unload, and move large trucks. Accommodating them more fully will contribute greatly to the future marketability of the NRCC.

This necessarily leads to a need to connect Hall Street and Broadway more adequately in order to create an "industrial spine" that connects the entire NRCC.

Business operators universally understand trucks. Fewer, however, capitalize on or know how to capitalize on rail transport. Many fewer still use or know how to use the river for transport. An aggressive campaign to educate business managers about the river, in particular, would be welcome to the many growth-oriented firms in the NRCC; indeed, many transport-dependent firms throughout the metropolitan area would benefit from more hands-on knowledge and support in the use of the river.

There is great need to create developable sites. Existing businesses in the NRCC are generally quite satisfied with the location and with the services received from the City and the various utility companies. Cleaning up, consolidating, and offering for development the many dilapidated and vacant properties would greatly reinforce this satisfaction. Such actions would also decrease the impressions of poor aesthetics and crime; indeed, crime and criminal behavior would be very much deterred if the NRCC appeared more attractive and included many newer buildings and tenants.

Competition is fierce, as generally depicted in the foregoing analysis. St. Louis as a region does not attract a great deal of annual industrial kind of growth—though it could markedly improve this trend with major international initiatives like Aerotropolis. There is ample land available at very competitive locations elsewhere in the region. Moreover, America's Central Port across the river from the NRCC is an aggressive user of the river and has proven to be very successful in attracting industrial operations.

Jefferson County is aggressively pursuing similar sites and marketing. Numerous high quality industrial parks in the region all demonstrate that a less-than-fully functioning NRCC will become more of a liability in the region than a competitive asset.

It is clear from the stakeholder interviews that **location** choices for industrial and transportation facilities are all about saving money. That is nothing new in the business world, of course, but it is a re-minder that expecting the private market alone to assemble large parcels in the NRCC or to build and repair roads is out of the question. The City has a vested interest in the commercial and tax value of the NRCC and, therefore, must be an active business, marketing, and financial partner.

Because it is all about saving money, the operating efficiency of facilities is of the utmost importance. This means modern structures with high capacity utilities and state-of-the art machinery and information technology. Many of the NRCC's most prominent businesses have made, and are openly willing to make, substantial investments in their properties to assure their long term economic efficiency. But these investments must be supported by public participation. That said, few stakeholders give the City low marks for willingness and ability in the support of operations in the NRCC. On the contrary, City officials have clearly impressed many businesses that the public is and will be a partner. This requires long-term commitment, of course, to assure that operating efficiencies are reflected on public property as well as private.

An oft-expressed concern about utility companies focuses on the Metropolitan Sewer District. Flooding is a frequent, if brief, problem in the NRCC. The need to control flooding combines with the lack of separate sewer systems for storm and sanitary purposes to cause MSD to require significant on-site stormwater storage for individual businesses and properties. While this has the effect of minimizing the chances for overflow of stormwater into sanitary systems, stormwater detention requires dedicated land area that removes such land from otherwise productive use. Such detention sites can be made visually attractive as landscaped water features, but it could be more effective—and more beneficial to area businesses—if the City could create relatively large detention ponds to be shared by multiple properties. Perhaps such ponds can be created on presently underutilized sites that do not impair the operations of existing businesses.

Interestingly, few businesses and developers expressed need for great amounts of "public incentives." For the most part, public improvements for utilities, roads, aesthetics, etc., create substantial incentives for private investment. Property tax abatement, however, is recognized as an important financial incentive so that the commitment to major property improvements does not become a larger tax burden all at once. Incentives like tax increment financing (TIF), on the other hand, do not appeal to most operations in the NRCC. TIF does not directly accrue to the business itself. Indeed, the business pays full taxes with TIF; even though some or all of those added taxes would be reinvested in a TIF district, such incremental taxes are far too unpredictable in an environment like the NRCC. However, TIF should be maintained as development incentive option for larger projects. TIF would be especially useful for projects that generate sales tax revenues, a portion of which can be invested back into the project.

Speculative industrial space is recognized as relatively easy to develop, highly competitive, and cost-driven. Two factors hinder such development, however. One is the lack of sizeable properties on which to develop in the NRCC. The other is the difficulty of obtaining financing in the lingering recession-fueled investment climate. Developers seem quite willing to create competitive industrial and related space in the NRCC, but they require public sector help in land assembly and securing appropriate financing.

As a geographic area, the NRCC is too big in many ways. The area needs to be artificially subdivided in order to phase future improvements in targeted areas. Yes, it is important to consolidate properties and eliminate vacant and functionally obsolete structures. However, spreading public resources too thin over the entire area would not accomplish major and tangible improvements. Instead, a targeted public investment program is necessary.

That said, key improvements throughout the NRCC where viable businesses operate are essential. These include, in particular, roadway improvements where trucking is conducted. It should be possible to avoid major commitments for land assembly and utility upgrades in some sections of the NRCC until improvements are completed in more marketable locations first.

That leads to a need for an overall management, marketing, capital improvements, and master leasing strategy for the entire NRCC. A strong recommendation to improve the marketability of the NRCC is to create a centralized management office with staff and day-to-day responsibilities focused on improving business conditions, attracting appropriate occupants, and enhancing public services such as cleaning, landscaping, and security.

Formation of a CID under Missouri enabling legislation, coupled with financial assessments of property owners and businesses in the NRCC will enable the NRCC to compete more directly with entities like America's Central Port, Gateway Commerce Center, and Earth City which are all effectively managed by a single authority or developer. In all likelihood, this is not a task that the City can or should take on. It is better to move such management to the NRCC itself, augmented, of course, with normal city services.

And the City, itself, can contribute mightily in other ways. It should, for instance, streamline the development/redevelopment approval process and/or create a team of city officials who form a "one stop shop" for such approvals, inspections, permitting, and so on. Plus, the City has political and legal influence that a single developer will not have. So a CID partnership where the City is a major participant would go a long way in helping to competitively position the NRCC for long-term economic sustainability.

Eventually, central management combined with City participation should lead to requirements for property covenants to maintain a consistency in the quality of buildings, to limit the amount of unsightly outside storage, to expand the quality of the NRCC's landscaping and curb appeal.

Key Actions

1. Focus on accommodating truck movements and loading needs. This will require some street widenings, improvements in queuing, creation of more off-street loading areas, and minimizing street blockage by freight trains. If trucks are better accommodated, the market for the NRCC is greatly enhanced.
2. Conduct educational campaigns to attract more transport business to and from the river. Many business operators, successful in other dimensions, seem too unaware of the possibilities of river transport. Making knowledge of the river more accessible will enhance economic diversity.
3. Create developable sites, which requires site assembly and all the attendant costs thereof. Almost certainly, this is a public sector responsibility because of the time and costs involved.
4. In the same vein, create common stormwater retention ponds to accommodate the demands of MSD while reducing pressures on individual sites and businesses.
5. Assist in marketing and financing to assure the creation of high quality industrial buildings and to encourage investments in operating efficiencies within existing businesses. The NRCC must be positioned in the market as a place for lower operating costs.
6. Continue to offer property tax abatement for significant private property improvements, but minimize the use of other incentives. The most valuable public incentives come from aesthetic, functional, and marketing initiatives for the entire NRCC.
7. Create an umbrella business management organization, ideally as a state-enabled community improvement district, to market and advocate for the entire NRCC.

Market Analysis for Bulk, Liquid and Containerized Cargo

The goal of the market analysis is to produce forecasts for the potential cargo that could be handled at an upgraded MRT, by commodity type, over a 20 year horizon.

The MRT is a multi-modal shipping and warehouse facility owned by the City of St. Louis and currently leased to and operated by Beelman, Inc. It is the only public, general purpose dock on the Missouri side of PMSL.

This section provides context about the larger environment in which the MRT operates. The goal is to "frame" the forecasts, starting first with a regional perspective focused on geography and the economy, and then narrowing down to local (PMSL) and site specific MRT factors.

The latter sections focus extensively on commodities that have potential to be transported in significant volumes at MRT over the next 20 years, and include both a SWOT Analysis and PEST Analysis to provide more insight into the MRT's growth potential and competitive position.

Regional Context

The City of St. Louis is located on approximately 66 square miles just south of the confluence of the Missouri and Mississippi Rivers. The St. Louis metropolitan area is approximately 7,000 square miles, spans 12 counties, and had a total population of 2,812,896 as of 2010 making it the 18th largest in the United States.

St. Louis is located near the geographic heart of the continental United States, a relatively short distance from other major metropolitan areas such as Kansas City (250 miles), Chicago (300 miles) Indianapolis (250 miles) and Memphis (300 miles).[1] St. Louis is within 500 miles of approximately one-third of the U.S. population and within 1,500 miles of 90 percent of the people in North America [2] As a result of its central geographical location, St. Louis has become a transportation hub of national importance. It is home to:

- Railroads: Six Class I railroads and several smaller rail lines, which includes more than 30 rail yard facilities, handling about 10,000 rail cars per day.
- Water transportation: More than 100 docks and terminal facilities which connect St. Louis to industrial centers in 15 states located along the Mississippi, Missouri, Ohio, Illinois and Tennessee Rivers, the Great Lakes and the Gulf of Mexico.
- Highways: Four interstate highways and four interstate linkages.
- Airports: Two major full service airports and three regional airports.
- Inter-modal: Numerous inter-modal facilities served by major railroad companies and shippers.
- Expanded Foreign Trade Zone (FTZ): The Foreign Trade Zone (FTZ) was expanded in late 2011 to include all of St. Louis City and County. This expansion will allow local companies to be competitive in the global market.

The Mississippi River is the second longest river in the United States, after the Missouri. Its drainage area covers about 40 percent of the country and includes all or part of 31 states. The Mississippi rises in Minnesota and then flows south, following the boundaries between the states of Minnesota, Iowa, Missouri, Arkansas, and Louisiana on the west, and Wisconsin, Illinois, Kentucky, Tennessee, and Mississippi on the east.[3]

Since the development of a lock and dam system on the river in 1913, it has served as an important transportation artery for bulk commodities. The largest single bulk items moved on the river are petroleum products- gasoline, kerosene, fuel oil, lubricating oil and coal shipped upstream from Texas, Louisiana, Illinois and western Kentucky. Downstream traffic has traditionally been dominated by grain such as corn, wheat, oats, barley and rye for transshipment to ocean vessels where it is transported to foreign markets.[4]

Several critical issues can impact the function of the river Too much water can lead to the flooding of low lying areas and have adverse impacts on the navigation network, decreasing maneuverability of vessels on the river and increasing the incidence of accidents. Low flow situations have been less frequent, though they can lead to the closure of channels in the system. For example in 1980-81, levels were so low that navigation stopped altogether. Conflicts over ownership and use of Great Lakes water have also surfaced between the U.S. and Canada as well as between U.S. States.[5]

1. http://stlouis.missouri.org/about/geography.html
2. http://www.stlrcga.org/x523.xml?ss=print
3. http://gatewayno.com/history/Mississippi.html
4. http://www.iptv.org/iowapathways/mypath.cfm?ounid=ob_000214
5. http://www.iitap.iastate.edu/gccourse/issues/society/misscase/textp33.html

ECONOMY

Missouri

According to data from the U.S. Department of Commerce, Missouri's inflation-adjusted Real GDP (based on year 2000 prices) was $194 billion in 2008. This places Missouri as the 22nd largest economy in the United States, behind Wisconsin and ahead of Louisiana. From 2000 to 2008, Missouri GDP grew at an annual rate of 1.2 percent, in real terms.[6]

Manufacturing led all sectors in the state's economy, contributing $32 billion in economic development in 2008, or 16.5 percent of the total state economic output. The state is home to railway car plants, automotive plants, steel mills, consumer goods plants, and a variety of other types of manufacturing activity.

Agriculture is also very important. The state produces beef, soybeans, pork, dairy products, hay, corn, poultry, sorghum, cotton, rice, and eggs. Missouri is one of the top producers of soy beans in the nation. As of 2001, there were 108,000 farms, second only to Texas.

The state's natural resources include limestone, lead, coal, and crushed stone. Missouri produces more lead than any other state and ranks near the top in the production of lime, a key component in cement.

Illinois

According to data from the U.S. Department of Commerce, Illinois' inflation-adjusted Real GDP (based on year 2000 prices) was $516 billion in 2008. This places Illinois as the 5th largest economy in the United States, behind Florida and ahead of Pennsylvania. From 2000 to 2008, Illinois GDP grew at an annual rate of 1.33 percent, in real terms. Real GDP grew at 0.25 percent from 2007 to 2008.[7]

Real estate was the most important sector in the state's economy, contributing $79.2 billion or 15.3 percent of the state's total economic output in 2008. This was followed by manufacturing, which contributed $78.8 billion or 15.2 percent of the state's total economic output in the same year.

St. Louis

The inflation-adjusted Real GDP of the St. Louis metropolitan area was $106 billion (based on 2001 prices) in 2008, making the St. Louis economy the 20th largest metro economy in the United States. Real GDP grew at 1.2 percent in real terms over the period 2001-2008. Economic growth from 2007 to 2008 was 5.2 percent in nominal terms, while in real terms the growth was 2.6 percent.[8]

Transportation and utilities is the largest sector in St. Louis, contributing $5.9 billion in 2008, or 5.6 percent of the city's economic output. In terms of industries, retail trade is also very important, accounting for $7.6 billion of the urban economy. Other industries include aviation, biotechnology, chemicals, electric utilities, food and beverage manufacturing, refining, research, and telecommunications.

Local Context: PMSL

BACKGROUND

MRT is part of the Port of Metropolitan St. Louis (PMSL), a port complex that extends 70 miles along both banks of the Mississippi River from the southern boundary of Jefferson County, Missouri to the northern boundary of Madison County, Illinois. A total of 134 piers, wharves and docks are located within the Port of Metropolitan St. Louis, including 76 wharves and docks on the Missouri side.

Handling more than 30 million tons annually, PMSL is the second largest inland port and twenty-fifth largest domestic port in the U.S. in terms of trip ton-miles. Petroleum, chemicals, grain and coal account for approximately 80 percent of the cargo handled at the port.[9]

PMSL comprises five public port authorities:

- City of St. Louis Port Authority, Missouri
- St. Louis County Port Authority, Missouri
- Jefferson County Port Authority, Missouri
- America's Central Port Authority, Illinois
- Southwest Regional Port District, Illinois

There were 130 facilities at PMSL in 2004, 61 of which were involved in cargo handling operations. The 69 non-cargo facilities provided mooring of barges for fleeting and other operations, or were not in use. The usage of the facilities and their ownership is summarized in *Table 2.1* on the following page.

6. *http://econpost.com/missourieconomy/missouri-gdp-size-rank*
7. *http://econpost.com/illinoiseconomy/illinois-gdp-size-rank*
8. *http://www.econpost.com/gdp/st-louis-missouri-illinois-gdp*
9. *http://www.unionmoed.com/infastruc.htm*

Number of Facilities	Private	Public	Private / Public	Total
All Facilities				
Total Cargo Facilities	53	6	2	61
Total Other Facilities	50	19	0	69
Total Facilities	103	25	2	130
Cargo Facilities				
Dry Bulk	23	2	1	26
Liquid Bulk	21	0	1	22
General Cargo / Multipurpose	9	4	0	13
Total Cargo Facilities	43	6	2	61
Non-Cargo/Not in Use Facilities				
Non cargo operations	43	17	0	60
Not in use	7	2	0	9
Total Non-Cargo Facilities	50	19	0	69

Table 2.1 - Facilities at PMSL
Source: USACE National Data Center Survey of Port Facilities, 2004, TranSystems
"Jefferson County Ports Phase 1 Feasibility Analysis," January 2010

Tables 2.2 to *2.4* show the terminals at PMSL in 2004, divided into dry bulk, liquid bulk and general cargo/multipurpose

Company Name	Location	Primary Commodities Handled	Receipt or Shipment	Rail Access?
ADM/Growmark River Systems	Right Bank	Grain	Both	Yes
Ameren Union Electric	Right Bank	Coal	Both	Yes
American Commercial Terminals	Right Bank	Coal	Shipment	Yes
Bluff City Minerals	Left Bank	Grain, soybean, soda ash, coal	Shipment	Yes
Bussen Quarries	Right Bank	Sand	Receipt	No
Bussen Terminal	Right Bank	Filter cake, copper, clay, lead, slag, scrap metal, coal, salt, and fertilizer	Receipt	Yes
Buzzi Unicem	Right Bank	Cement, coke	Receipt	Yes
Cargill AgHorizons	Left Bank	Grain	Shipment	Yes
ConAgra Foods	Left Bank	Wheat, rye, pellets	Receipt	Yes
Continental Cement	Right Bank	Cement	Receipt	Yes
Dynegy Midwest Generation	Left Bank	Coal	Receipt	Yes
Fred Weber	Right Bank	Sand	Receipt	No
Italgrani Elevator	Right Bank	Grain	Shipment	Yes
Peavey / Conagra	Left Bank	Grain, fertilizer, chemicals, coal	Both	Yes
The American Milling Co	Left Bank	Grain, coal, salt, fertilizer, livestock feed	Both	Yes

Table 2.2 - Cargo Facilities: Dry Bulk Terminals at PMSL
Source: USACE National Data Center Survey of Port Facilities, 2004, TranSystems
"Jefferson County Ports Phase 1 Feasibility Analysis," January 2010

The tables suggest, and it is indeed the case, that several companies are using the terminals as dedicated storage and distribution hubs for their own products. For example, Cargill AgHorizons is a large conglomerate specializing in the marketing and distribution of grain,and it maintains a terminal for the shipment of grain on the left bank (Illinois side). This type of supply management is something to note when considering potential markets for the MRT, as is the preponderance of specialist liquid cargo handling.

The Port's cargo volumes over the past decade have ranged from a low of 29.5 million tons in 2008 to a high of 33.4 million tons in 2004. The greatest year-over-year change was a decline in volume of 9 percent from 2004 to 2005. The greatest year-over-year increase in volume was 6 percent from 2008 to 2009. The following graph shows that total tonnage (in both directions) at PMSL was fairly consistent from 2000 to 2009, with the exception of a major drop in volume in 2008.

Company Name	Location	Primary Commodities Handled	Receipt or Shipment	Rail Access?
American River Transportation	Right Bank	Petroleum products	Both	Yes
Brenntag Mid-South	Right Bank	Liquid chemicals and petrochemicals	Both	Yes
Broadway Petroleum Co	Right Bank	Asphalt	Receipt	Yes
Center Point Terminal Co	Right Bank	Fuel oil and asphalt	Both	No
ConocoPhillips	Left Bank	Fuel oil, petroleum products, asphalt, benzene	Both	Yes
Economy Boat Store	Left Bank	Petroleum products	Both	Yes
J. D. Streett & Co	Right Bank	Petroleum products, caustic soda, ethylene glycol, ethanol	Both	Yes
Kiesel Marine Service	Right Bank	Petroleum products	Receipt	No
Koch Fertilizer Storage and Terminal	Left Bank	Anhydrous ammonia	Both	Yes
Marathon Ashland Pipe Line	Left Bank	Crude oil and petroleum products	Both	No
Petroleum Fuel and Terminal Co	Left Bank	Asphalt	Both	Yes
Shell Oil Products U.S.	Right Bank	Asphalt and petroleum products	Both	Yes
Slay Bulk Terminals	Right Bank	Liquid chemicals	Receipt	Yes
The Doe Run Co	Right Bank	Sulphuric acid	Shipment	Yes
The Premcor Refining Group	Left Bank	Petroleum products	Both	No
The Valvoline Co	Right Bank	Lubricating oil	Receipt	Yes

Table 2.3 - Cargo Facilities: Liquid Bulk Terminals at PMSL
Source: USACE National Data Center Survey of Port Facilities, 2004, TranSystems "Jefferson County Ports Phase 1 Feasibility Analysis," January 2010

Company Name	Location	Primary Commodities Handled	Receipt or Shipment	Rail Access?
Azcon Corp.	Left Bank	Scrap metal, steel	Both	Yes
Beelman River Terminals	Both	Grain, coal, coke, sand, scrap metal, other heavy-lift, general purpose, dry bulk and liquid bulk	Both	Yes
Bussen Terminal	Right Bank	Fertilizer, steel, pipe, coal, salt, filter cake, copper, clay, lead, slag, scrap metal	Both	Yes
Cahokia Marine Service	Left Bank	Steel products, grain, benzene, fertilizers, coal, stone, and sand	Both	Yes
Lange-Stegmann	Right Bank	Fertilizer, coal, coke, miscellaneous ores, grain, and salt	Receipt	Yes
Mid-Coast Terminal	Left Bank	General cargo, steel, liquid and dry-bulk fertilizer, packaged goods	Both	Yes
Phoenix Terminal Co.	Left Bank	Steel products, lumber, sand, grain, coal, coke	Both	No
St. Louis Auto Shredding	Left Bank	Scrap metal	Shipment	No
Transload Services	Right Bank	Steel	Both	Yes
U.S. Steel, Granite City Works	Left Bank	Steel products	Both	Yes

Table 2.4 - Cargo Facilities: General Cargo/ Multi-Purpose Terminals at PMSL
Source: USACE National Data Center Survey of Port Facilities, 2004, TranSystems "Jefferson County Ports Phase 1 Feasibility Analysis," January 2010

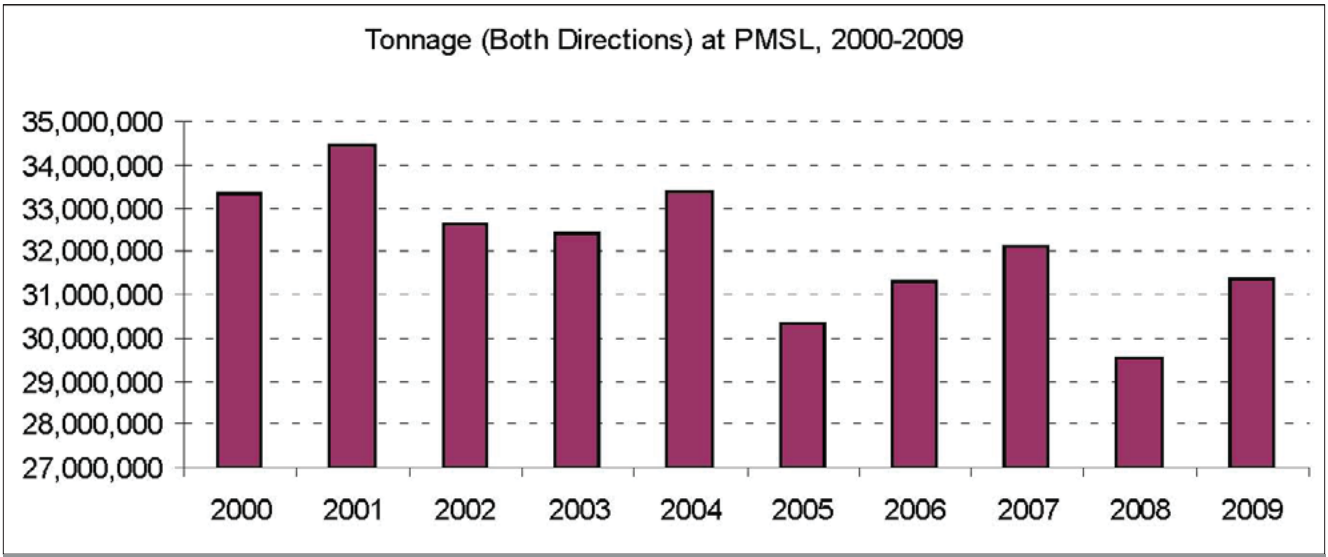

Figure 2.1 - Tonnage (Both Directions) at PMSL, 2000-2009

To determine whether there might be a statistical relationship between tonnage at PMSL and economic trends, regression analyses was carried out for U.S. GDP, U.S. Industrial Production, Missouri and Illinois State GDP, Missouri and Illinois Resident Population, Missouri and Illinois Manufacturing Employment, Missouri and Illinois Natural Gas and Mining Employment, and U.S. Field Production of Crude Oil. The analysis showed no conclusive statistical relationship between any of the economic indicators and PMSL volumes. This suggests that other factors are driving volumes at PMSL, such as specific customer demand that is not directly linked to global, regional or even local economic performance, a situation that warranted a closer analysis of the commodities handled.

ALL DIRECTIONS (Tons)

Rank	Commodity	CY2009	% of TOTAL
1	Coal & Lignite	12,264,340	39.1%
2	Corn	3,875,018	12.4%
3	Soybeans	2,592,660	8.3%
4	Asphalt, Tar & Pitch	1,406,176	4.5%
5	Sand & Gravel	1,358,759	4.3%
6	Wheat	1,137,600	3.6%
7	Oilseeds NEC	976,800	3.1%
8	Cement & Concrete	874,036	2.8%
9	Alcohols	812,856	2.6%
10	Lube Oil & Greases	661,823	2.1%
11	Crude Petroleum	648,013	2.1%
12	Animal Feed, Prep.	618,270	2.0%
13	Nitrogenous Fert.	472,570	1.5%
14	Non-Metal. Min. NEC	446,989	1.4%
15	Iron & Steel Scrap	383,265	1.2%
16	Waterway Improv. Mat	343,834	1.1%
17	Distillate Fuel Oil	322,942	1.0%
18	Naphtha & Solvents	302,999	1.0%
19	Sodium Hydroxide	240,206	0.8%
20	Fertilizer & Mixes NEC	232,224	0.7%
	TOTAL	29,971,380	95.6%
	All Commodities	31,336,831	

Table 2.5 - Cargo Volume at PMSL (by Commodity, Both Directions)

COMMODITIES

In 2009, the top 20 commodities accounted for 95 percent of two-way traffic at PMSL. The top commodity by volume in 2009 was coal and lignite, accounting for 39.1 percent of all cargo. This was followed by corn (12.4 percent) and soybeans (8.3 percent). Table 2.5 presents the commodities for all directions in 2009.

The vast majority of commodities are classified as "shipments" rather than "receipts". This means most of the cargo is effectively being exported out of PMSL.

Approximately 25.6 million tons of cargo was considered a shipment in 2009, as versus 4 million tons in receipt (an additional 1.7 million tons was classified as "intra-port". *Tables 2.6* and *2.7* break down commodity flow by direction.

The top commodity received at PMSL in 2009 was nitrogenous fertilizer, at nearly 12 percent of receipts, followed by non-metallic minerals (Not Elsewhere Classified) at 11 percent of receipts. Both of these commodities are essentially inputs to a production process; in the former case, to agricultural production, and in the latter case, to industrial and consumer goods production.

Coal dominates the market for shipments at PMSL, with 47 percent share of all shipments. This is followed by three agricultural commodities: corn, soybeans and wheat. PMSL also ships out a lot of asphalt, tar and pitch, as well as oilseeds. The top 20 shipments make up virtually all of the shipment volume.

RECEIPTS (Tons)			
Rank	Commodity	CY2009	% of TOTAL
1	Nitrogenous Fert.	469,370	11.7%
2	Non-Metal. Min. NEC	440,620	11.0%
3	Waterway Improv. Mat	343,834	8.6%
4	Lube Oil & Greases	322,768	8.0%
5	Naphtha & Solvents	286,594	7.1%
6	Coal & Lignite	262,645	6.5%
7	Cement & Concrete	252,461	6.3%
8	Sodium Hydroxide	238,657	5.9%
9	Fert. & Mixes NEC	226,195	5.6%
10	Distillate Fuel Oil	214,964	5.3%
11	Sand & Gravel	100,875	2.5%
12	Asphalt, Tar & Pitch	95,200	2.4%
13	Iron Ore	78,756	2.0%
14	Coal Coke	68,402	1.7%
15	Hydrocarbon & Petrol Gases, Liquefied and Gaseous	68,093	1.7%
16	I&S Plates & Sheets	60,279	1.5%
17	Gypsum	58,722	1.5%
18	Gasoline	58,009	1.4%
19	Potassic Fert.	56,811	1.4%
20	Residual Fuel Oil	56,136	1.4%
	TOTAL	3,759,391	93.5%
	All Receipts	4,020,059	

Table 2.6 - Cargo Volume at PMSL (by Commodity, Receipts)
Source: USACE Waterborne Statistics Data Center

SHIPMENTS (Tons)			
Rank	Commodity	CY2009	% of TOTAL
1	Coal & Lignite	11,995,172	46.9%
2	Corn	3,866,232	15.1%
3	Soybeans	2,592,660	10.1%
4	Wheat	1,117,084	4.4%
5	Asphalt, Tar & Pitch	1,110,109	4.3%
6	Oilseeds NEC	976,800	3.8%
7	Alcohols	795,976	3.1%
8	Crude Petroleum	648,013	2.5%
9	Animal Feed, Prep.	583,958	2.3%
10	Iron & Steel Scrap	377,068	1.5%
11	Lube Oil & Greases	335,255	1.3%
12	Cement & Concrete	270,575	1.1%
13	Sand & Gravel	170,094	0.7%
14	Benzene & Toluene	137,767	0.5%
15	Slag	75,355	0.3%
16	I&S Plates & Sheets	67,930	0.3%
17	Sorghum Grains	65,468	0.3%
18	Coal Coke	57,987	0.2%
19	Petroleum Coke	49,949	0.2%
20	Residual Fuel Oil	45,550	0.2%
	TOTAL	25,339,002	99.1%
	All Commodities	25,581,268	

Table 2.7 - Cargo Volume at PMSL (by Commodity, Shipments)
Source: USACE Waterborne Statistics Data Center

Site-Specific Context: MRT

The MRT comprises 27 acres, with two public docks and storage facilities. It is the northernmost lock and ice-free port along the Mississippi River.

Currently, facilities at the MRT range from 30 to 70 years old, some of which are in poor condition. The South Dock was recently damaged by flooding and requires immediate repairs. Consequently, it is currently undergoing a $19.6 million reconstruction improvement.

In order to better understand the historical use of the MRT site, a thorough analysis of tonnage records for the last 10 years was carried out. The records were provided by the current lessee, Beelman Inc. There were 47 different commodities in the accounts. All of the data for these commodities was entered into Excel to enable ease of analysis. A figure showing the total volumes by year, classified as "inbound" or "outbound," is shown below in *Figure 2.2*.

The classification of "Inbound" and "Outbound" does not necessarily align with the definition of "Imports" and "Exports," nor with "Receipts" and "Shipments." Rather, all commodities entering the terminal are recorded as inbound when they enter the terminal, regardless of mode (truck, rail or barge); consequently, they are recorded as outbound when they leave the terminal.

For example, 200,000 tons of fertilizer enters the terminal by barge in June and 180,000 tons of the same fertilizer leaves by truck in July. The accounts would then note 200,000 tons of fertilizer inbound in June and 180,000 tons of fertilizer outbound in July. However, PMSL may simply record this transaction as 200,000 tons of fertilizer imported by the Port.

When the inbound volume does not equal outbound volume, it could be a case of stockpiling or holding on to it until the appropriate transportation can be secured.

One important thing to note when looking at the tonnage data is that volumes do not proceed in a smooth, linear fashion from one year to the next; on the contrary, they appear, for the most part, very unpredictable. This suggests that customer decisions to import or export a certain volume of commodity, which may appear minor when considered against overall PMSL volumes, can have a huge impact upon volumes at the MRT given the relatively low volumes there. One thing is clear from MRT's throughput pattern: the overall trend over the last ten years has been negative.

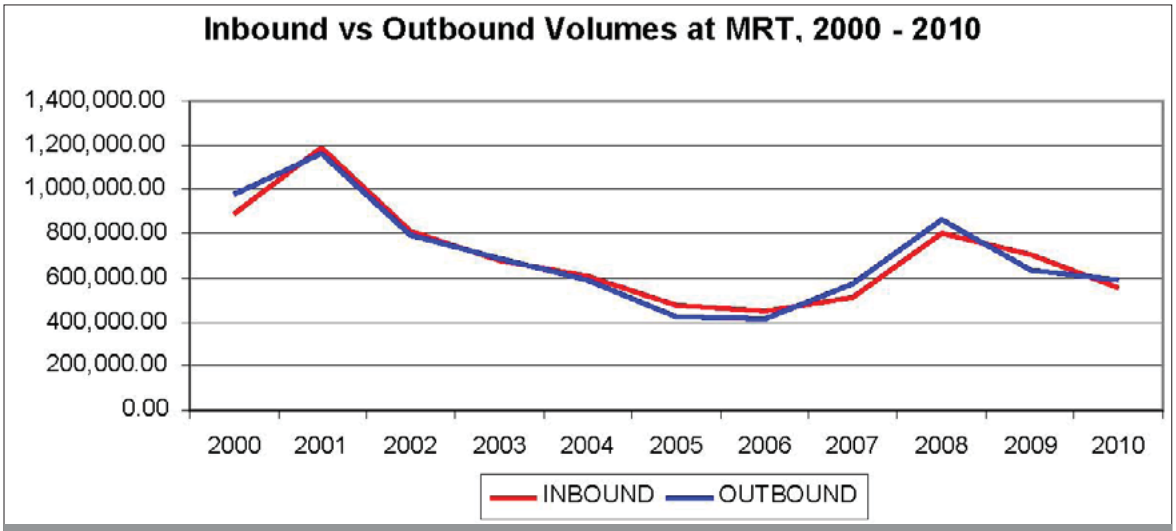

Figure 2.2 - Inbound versus Outbound Volumes at MRT, 2000-2010
Source: Beelman

COMMODITIES

After assembling the commodity data, it was organized by mode and direction. As part of this process, and to simplify the analysis, similar commodities were grouped together; for example, coke was grouped with foundry coke, pet coke, rice coke, and coke breeze. This brought the number of commodities in the study down to 36.

In the process of analyzing the commodity data, it was apparent that volumes at the MRT have, over the past ten years been dominated by a handful of commodities. In fact, the analysis showed that the top five commodities, by volume, accounted for 83 percent of the total volume over the past ten years, while the top ten commodities accounted for 93 percent of the total volume. The same held true when the same analysis was carried out for the past five years of data.

Inbound and outbound tonnage data for the ten highest volume commodities over the period July 2000 to December 2010 are presented in *Tables 2.8* and *2.9*.

COMMODITY	Inbound Volume, 2000-2010			TOTAL
	Barged	Railed	Trucked	
Salt	2,307,198.77	34,653.95	65,689.25	2,407,541.97
B-Scrap / Scrap / Shredded Scrap	76,670.76	1,349.67	1,761,817.96	1,839,838.39
Coal	1,200,295.93	0.00	169,876.65	1,370,172.58
Coke / Pet Coke / Coke Breeze / Rice Coke / Foundry Coke	320,987.99	0.00	120,776.17	441,764.16
Caustic	215,785.86	0.00	7,171.63	222,957.49
Aluminum Process Residue	21,416.69	0.00	170,280.55	191,697.24
Bauxite	64,563.59	15,378.77	108,442.66	188,385.02
Sand	0.00	1,201.59	174,936.78	176,138.37
Magnetite	118,107.70	3,298.55	18,123.00	139,529.25
Ferro Manganese	106,910.54	0.00	18,447.91	125,358.45

Table 2.8 - Tonnage for Top Ten Commodities at MRT from 2000 to 2010
Source: Beelman

Tables 2.8 and *2.9* clearly show that, from 2000 to 2010, inbound volumes have not necessarily equaled outbound volumes at MRT. For example, 2.4 million tons of salt was classified as inbound over the ten-year period, whereas 2.35 million tons of salt was outbound. Thus, MRT brought in nearly 500,000 tons more of salt than it sent out. This large discrepancy in inbound and outbound volumes for salt appears to be more of the exception than the rule, as the difference in inbound and outbound volumes tends to be less than 100,000 tons for most commodities.

It is not possible to state with certainty that a commodity was an import simply because it was brought into the terminal by barge; the commodity in question could actually have been an export waiting to be consolidated with more of the same product before being sent abroad.

The same reasoning applies to commodities being sent out of the terminal by barge. Thus, the report avoids classifying MRT's volumes as either imports or exports. Rather, the basis for discussion going forward is the one way, outbound volumes at MRT.

The study team decided to use outbound volumes because it felt that these were more reflective of customer demand than inbound volumes. For example, 10,000 tons of salt may be barged into the terminal in a given year; 1,000 tons are used at the terminal for deicing purposes, and 9,000 tons are sent out to buyers by truck. Thus, customers wanted 9,000 tons of salt, even though the terminal brought in 10,000 tons.

COMMODITY	Outbound Volume, 2000-2010			TOTAL
	Barged	Railed	Trucked	Inbound
Salt	45,173.06	0.00	2,303,621.38	2,348,794.44
B-Scrap / Scrap / Shredded Scrap	1,744,595.23	23,089.62	93,532.10	1,861,216.95
Coal	124,146.67	0.00	1,337,420.03	1,461,566.70
Coke / Pet Coke / Coke Breeze / Rice Coke / Foundry Coke	111,451.82	1,205.06	334,019.10	446,675.98
Caustic	4,349.41	2,458.55	227,255.05	234,063.01
Aluminum Process Residue	158,813.21	0.00	8,272.86	167,086.07
Bauxite	125,396.78	13,308.28	49,889.98	188,595.04
Sand	0.00	174,936.78	0.00	174,936.78
Magnetite	8,971.96	29,821.67	70,843.42	109,637.05
Ferro Manganese	5,038.70	0.00	126,146.32	131,185.02

Table 2.9 - Tonnage for Top Ten Commodities at MRT from 2000 to 2010
Source: Beelman

As in the case for PMSL cargo volumes, we ran a number of regression analyses in order to determine whether there was a statistically relevant correlation between the MRT's traffic flows and a range of economic factors. In keeping with the results of the PMSL regression analyses, the results for the MRT failed to demonstrate any strong statistical relationships with the key anticipated economic drivers. The lack of statistical significance, combined with the non-linear pattern of tonnage from one year to the next, indicates that volumes cannot and should not be forecasted through econometric methods.

There are, however, other means to forecast cargo volumes for the MRT. The team's proposed alternative methodology relies heavily upon market analysis and share assumptions of potential commodities for the MRT. The following section looks at these commodities more closely to understand if and why they are good prospects for the new terminal.

Table 2.10 provides further detail of the modes used for the top ten commodities and their primary uses.

COMMODITY	PRIMARY INBOUND MODE	PRIMARY OUTBOUND MODE	INDUSTRIAL USES
Salt	Barged	Trucked	Feedstock, water softening, pulp and paper, textiles, rubber, ceramics, soap, oil and gas drilling, street de-icing.
B-Scrap / Scrap / Shredded Scrap	Trucked	Barged	Manufacturing of products for appliance, construction, container, machinery, oil and gas, transportation, and other industries.
Coal	Barged	Trucked	Power generation and steel production are the main uses. Also used for aluminum, paper, chemical, and pharmaceutical industries.
Coke / Pet Coke / Coke Breeze / Rice Coke / Foundry Coke	Barged	Trucked	Used as a smelting agent to produce pig iron and metal castings. Also used to produce phosphorous and calcium carbide.
Caustic	Barged	Trucked	Used in pulp and paper, textiles, soap and detergents, bleach, aluminum manufacturing. Used by petroleum industry for exploration of oil and natural gas.
Aluminum Process Residue	Trucked	Barged	Aluminum is used for construction, packaging, consumer goods, machinery, and aircraft.
Bauxite	Trucked	Barged	Used in automotive and airplanes, bottling and canning industries; kitchen cookware and foil; building and electrical; personal products, like deodorants.
Sand	Trucked	Railed	The petroleum industry injects sand into oil wells. Also used in ceramics, on golf courses, and as a filter medium. Used in foundry and automotive industry operations. Railroads use large amounts of sand to improve traction on wet or slippery rails.
Magnetite	Barged	Trucked	Important in manufacturing steel. Also used by railroad industry to keep trains on track.
Ferro Manganese	Barged	Trucked	The chlorine industry for bleach manufacture; the steel industry; other metallurgical applications; uses in the chemical industry.

Table 2.10 - Market Data and Mode for Top 10 Commodities at MRT
Source: Beelman, Halcrow

Commodities Analysis

This section analyzes the most frequently transported commodities at the U.S. national level as well as both PMSL and MRT over the past five years. The purpose of this analysis is to clearly identify the commodities with market potential for MRT. This will help to identify the commodities with the greatest future potential for MRT.

This section is divided into two sub-sections. The first sub-section examines commodities that were transported in mid-to-high volume at PMSL; these commodities are an existing market with proven demand. The second sub-section looks at commodities that were transported in low volume at PMSL; these commodities are a potential market with unproven demand.

The data source for the U.S. national data in this section is primarily the U.S. Geological Survey. The data source for the PMSL data is primarily the U.S. Army Corps of Engineering (USACE). The data source for the MRT data is primarily tonnage records provided by Beelman Inc. Growth rates are expressed as Compound Average Growth Rate (CAGR).

HIGH VOLUME COMMODITIES AT PMSL

1. Coal:

Coal is abundant, relatively inexpensive, and a widely used source of energy in the United States. In fact, domestic coal is the primary source of fuel for electric power plants. U.S. industries continue to use coal for fuel and coke production and there is a large overseas market for high-quality American coal. Despite its popularity, however, coal usage does present hazards to environmental quality and human health, and efforts are underway to reduce domestic reliance upon the fossil fuel.[10]

U.S. (National) Volumes:

- Volume of U.S. coal imports and exports, 2005-2009: 459 million tons.
  - CAGR of coal (both directions), 2005-2009: 0.3 percent
- Volume of coal imports, 2005-2009: 160 million tons.
  - Percentage of imports relative to total coal trade, 2005-2009: 35 percent.
  - CAGR of coal imports, 2005-2009: -5.8 percent.
- Volume of coal exports, 2005-2009: 299 million tons.
  - Percentage of exports relative to total coal trade, 2005-2009: 65 percent
  - CAGR of coal exports, 2005-2009: 3.4 percent
- Volume of U.S. coal imports, 2009: 22.6 million tons.
  - Imports average about 3 percent of U.S. consumption per year.
  - Colombia accounts for 75 percent of all U.S. coal imports.
- Volume of U.S. coal exports, 2009: 59.1 million tons.
  - Foreign exports from Alabama, 2008: 8 million tons.
    - Produces 12 million tons for domestic market.
  - Foreign exports from Illinois, 2008: 3 million tons.
    - Produces 30 million tons for domestic market.
  - Foreign exports from Kentucky, 2008: 6 million tons
    - Produces 119 million tons for domestic market.
  - Exports from New Orleans, 2009: 2.25 million tons.
  - Metallurgical Coal exports in 2009:
    - Exports to Europe: 19.7 million tons.
    - Exports to Asia: 5.6 million tons.
      - Increase from 2008: 32.2 percent.
    - Exports to India: 2.1 million tons.
    - Exports to Brazil: 7.4 million tons.
  - Steam Coal exports in 2009:
    - Exports to Brazil: 7.4 million tons.
    - Exports to Canada: 8.2 million tons.
    - Exports to Europe: 10.4 million tons.
    - Exports to Asia: 0.9 million tons.

Summary: The U.S. exports far more coal than it imports, and exports have been growing faster than imports over the past 5 years. The main coal producers close to the Mississippi River basin are Kentucky, Alabama and Illinois. The main foreign market for metallurgical coal is Europe, though exports to Asia are growing rapidly. The main foreign markets for steam coal exports is Europe, though Canada is the largest single buyer.

Bottom line: A Mississippi River terminal could capture steam coal going north from Alabama or Kentucky or metallurgical coal going south from Illinois.

PMSL Volumes:

- Volume of coal (both directions) at PMSL, 2005-2009: 58.5 million tons.
  - CAGR of coal (both directions), 2005-2009: 2 percent.
- Volume of coal receipts at PMSL, 2005-2009: 3 million tons.
  - CAGR of coal receipts, 2005-2009: -21 percent.
- Volume of coal shipments at PMSL, 2005-2009: 54 million tons.
  - CAGR of coal shipments, 2005-2009: 4 percent.
- Volume of coal at PMSL, 2009: 12.3 million tons.
  - Volume of receipts, 2009: 262,645 tons
    - Percentage of PMSL of receipts: 2 percent.
    - 2009 PMSL receipts as a percentage of 2009 U.S. imports: 1.16 percent.
  - Volume of receipts, 2009: 262,645 tons
    - Volume of shipments, 2009: 12 million tons.
    - Percentage of total PMSL volume shipments: 98 percent.
    - 2009 PMSL shipments as a percentage of 2009 U.S. exports: 20.3 percent.

Summary: Shipments are a much bigger market for PMSL than receipts, and have been growing unlike receipts which have been falling precipitously over the past five years. PMSL's shipments also constitute one-fifth of all U.S. coal exports, whereas receipts are negligible relative to U.S. coal imports.

10. http://energy.er.usgs.gov/coal_studies/index.htm

MRT Volumes:[*11]

- Total volume of coal at MRT (outbound), 2005-2009: 280,674 tons.
  - Volume of coal at MRT as a percent of total PMSL coal, 2005-2009: 0.5 percent.
  - CAGR of coal at MRT, 2005-2009: 17 percent.
  - 89 percent barged, 11 percent trucked inbound.
  - 91 percent trucked, 9 percent barged outbound.
- Total volume of outbound coal, 2009: 43,836 tons.
  - MRT outbound volume as a percent of PMSL receipts, 2009: 17 percent.
  - MRT outbound volume as a percent of PMSL shipments, 2009: 0.3 percent.

Summary: MRT recorded strong growth in coal over the past five years. Since most coal was barged in and trucked out, it is assumed that the terminal was importing coal. In 2009, it had 16 percent market share of PMSL coal receipts.

Records dating back to 2000 show that coal tonnage is not very consistent: in 2001, the terminal handled 436,829 inbound tons, but this dropped to 14,355 inbound tons by 2004. Tonnage picked up in 2008, with 91,558 tons handled, but this number dropped by half the following year. There is strong competition, with no fewer than 11 other terminals competing for the coal transportation market at PMSL.

Bottom Line: MRT was not active in the coal shipment market, and thereby missed out on the segment with the highest volume in 2009 and highest growth from 2005-2009.

*2. Grain (including corn and wheat)[*12]*

U.S. (National) Volumes

- Total volume of U.S. grains and feeds imports and exports, 2005-2009: 153 million tons.
  - CAGR of grains and feeds (both directions), 2005-2009: 10 percent.
- Total volume of grains and feeds imports, 2005-2009: 31 million tons.
  - CAGR of grains and feeds imports, 2005-2009: 10 percent
- Total volume of grains and feeds exports, 2005-2009: 122 million tons.
  - CAGR of grains and feeds exports, 2005-2009: 9 percent
- Total volume of U.S. grains and feeds imports, 2009: 7.2 million tons.
- Total volume of U.S. grains and feeds exports, 2009: 24.7 million tons.
  - Japan is the biggest importer, at 5.2 million tons, followed by Mexico at 3.6 million tons and Canada at 2.9 million tons in 2009.
  - In 2009, Louisiana was the biggest exporter at 5 million tons, though this does not necessarily mean it was the biggest producer. Illinois exported 750,000 tons and Missouri exported 175,000 tons.

Summary: The U.S. grains and feeds market had strong growth of around 10 percent in both imports and exports from 2005 to 2009. Exports outnumbered imports by a ratio of 4:1 over this period. Japan is the biggest buyer of U.S. grains and feeds, and Louisiana is the biggest exporter.

Bottom Line: The market is huge and growing, both on the import and export side.

PMSL Volumes

Grain transportation on the Mississippi River has been in decline for decades.[11] This is partly due to the rising production of grain in foreign nations, which have copied U.S. production techniques, as well as an increase in domestic demand for grain. This domestic demand can be met by rail or truck, and mostly does not require barge transportation.

- Volume of grain (both directions) at PMSL, 2005-2009: 25.9 million tons.
  - CAGR of grain (both directions), 2005-2009: -1 percent
- Volume of grain receipts at PMSL, 2005-2009: 132,433 tons.
  - CAGR of grain receipts, 2005-2009: 14 percent.
- Volume of grain shipments at PMSL, 2005-2009: 25.7 million tons.
  - CAGR of grain shipments, 2005-2009: -1 percent.
- Volume of grain at PMSL, 2009: 5.1 million tons.
  - Volume of receipts, 2009: 31,026 tons
    - Percentage of total PMSL volume receipts: 1 percent.
    - 2009 PMSL receipts as a percent of 2009 U.S. imports: 0.4 percent.
  - Total volume of shipments, 2009: 5.1 million tons.
    - Percentage of total PMSL volume that was shipments: 99 percent.
    - 2009 PMSL shipments as a percent of 2009 U.S. exports: 21 percent.

Summary: PMSL experienced high volumes of grain transport, virtually all shipments, though stagnant growth from 2005 to 2009. In 2009, its shipments had 21 percent market share of all U.S. grains and feeds exports.

Bottom Line: Grain volumes at PMSL did not grow in line with the nation as a whole, though the port is still a national player in the grain shipment market.

*[*11] Assumes that inbound = outbound. This differs from PMSL's classification of "receipt" and "shipment". The inbound volume at MRT could either be a receipt or a shipment, depending on whether it is intended to be an import into the region or an export out of the region. In this case, the outbound volumes are important because they show what volumes left the terminal and headed for destination markets.*

*[*12] In a typical year, corn accounts for around 63 percent of U.S. grain production (measured in tons).*

MRT Volumes:

- Volume of grain at MRT (outbound), 2005-2009: 2,210 tons.
  - Volume of grain at MRT as a percentage of total PMSL grain, 2005-2009: 0 percent.
  - CAGR of grain at MRT, 2005-2009: n/a.
  - 100 percent barged inbound.
  - 100 percent trucked outbound.
- Total volume of outbound grain, 2009: 0 tons
  - MRT outbound volumes as a percent of PMSL receipts: 0 percent.

Summary: MRT handled an insignificant amount of grain from 2005 to 2009, including no volumes in 2009.

Bottom Line: MRT is missing out on a market with strong recent growth nationally, in which PMSL enjoys significant national market share.

3) Oilseeds (including soybeans)

U.S. (National) Volumes

- Volume of U.S. oilseeds imports and exports, 2005-2009: 111 million tons.
  - CAGR of oilseeds (both directions), 2005-2009: 16 percent.
- Volume of oilseeds imports, 2005-2009: 23 million tons.
  - CAGR of oilseeds imports, 2005-2009: 10 percent.
- Volume of oilseeds exports, 2005-2009: 88 million tons.
  - CAGR of oilseeds exports, 2005-2009: 18 percent.
- Volume of U.S. oilseed imports, 2009: 4.9 million tons.
- Volume of U.S. oilseed exports, 2009: 24.6 million tons.
  - China was the largest importer of U.S. oilseeds, at 9.3 million tons in 2009, followed by Mexico at 2.5 million tons and Canada at 1.5 million tons.
  - Louisiana was the biggest exporter, at 7.8 million tons in 2009. Illinois exported one million tons and Missouri exported 115,000 tons.

Summary: With over 100 million tons of trade from 2005 to 2009, oilseeds are an important commodity. The majority is for export although 23 million tons were also imported from 2005 to 2009. Growth was strong in both segments, with exports outpacing imports 18 percent to 10 percent in CAGR from 2005 to 2009. China was the largest destination for U.S. oilseeds in 2009, while Louisiana was the largest exporter.

Bottom Line: Oilseeds produced in Illinois and Missouri could be transported south to domestic markets or to the Port of New Orleans for shipment to foreign markets.

PMSL Volumes

- Volume of oilseeds (both directions) at PMSL, 2005-2009: 12.4 million tons.
  - CAGR of oilseeds (both directions), 2005-2009: 11 percent.
- Volume of oilseeds receipts at PMSL, 2005-2009: 38,484 tons.
  - CAGR of oilseeds receipts, 2005-2009: -100 percent.
- Volume of oilseeds shipments at PMSL, 2005-2009: 12.3 million tons.
  - CAGR of oilseeds shipments, 2005-2009: 11 percent.
- Volume of oilseeds at PMSL, 2009: 3.6 million tons
  - Total volume of receipts, 2009: 0
    - Percentage of total PMSL volume that was receipts: 0 percent.
    - 2009 PMSL receipts as a percent of 2009 U.S. imports: 0 percent.
- Volume of shipments, 2009: 3.6 million tons.
  - Percentage of total PMSL volume shipments: 100 percent.
  - 2009 PMSL shipments as a percentage of 2009 U.S. exports: 15 percent.

Summary: PMSL is primarily in the oilseed shipment business; receipts were negligible from 2005 to 2009. Shipments grew at 11 percent over the period. In 2009, shipments of 3.6 million tons accounted for 15 percent of U.S. oilseeds exports.

Bottom Line: PMSL's geographical location has supported its strong growth in oilseeds shipments over the past 5 years.

There is no record of oilseeds being transported at MRT from 2000 to 2010.

4. Asphalt, Tar and Pitch (ATP)

U.S. (National) Volumes

- Volume of U.S. asphalt imports and exports, 2005-2009: 17.9 million tons.
  - CAGR of asphalt (both directions), 2005-2009: -2 percent.
- Volume of asphalt imports, 2005-2009: 11.7 million tons.
  - CAGR of asphalt imports, 2005-2009: -12 percent.
- Volume of asphalt exports, 2005-2009: 6.2 million tons.
  - CAGR of asphalt exports, 2005-2009: 20 percent.
- Volume of U.S. asphalt imports, 2009: 1.4 million tons.
  - 59 percent of imports came from Venezuela in 2000; this number was 1 percent for the first 6 months of 2010.
  - Canada supplied 99 percent of imports for first 6 months of 2010.
- Volume of U.S. asphalt exports, 2009: 1.8 million tons.
  - Gulf coast was the biggest exporter in 2010, at 712,000 tons, followed by the Midwest at 483,000 tons.
  - China and India expected to make up the bulk of demand, exceeding U.S. consumption by 2015.

Summary: Asphalt imports were nearly double the volume of exports over the period 2005 to 2009, though imports declined at a CAGR of 12 percent while exports grew at 20 percent over the period. The decline in imports could be attributed to a halt in trade with Venezuela, which was the biggest source in 2000 and all but disappeared by 2010, replaced by Canada. The Gulf Coast was the biggest exporter in 2010, and the developing nations of Asia are the biggest buyers.

Bottom Line: Though a small market in terms of trading volume, asphalt exports have strong prospects with rising demand in rapidly developing nations.

PMSL Volumes

- Volume of ATP (both directions) at PMSL, 2005-2009: 8.5 million tons.
  - CAGR of ATP (both directions), 2005-2009: -4 percent.
- Volume of ATP receipts at PMSL, 2005-2009: 966,925 tons.
  - CAGR of ATP receipts, 2005-2009: -19 percent.
- Volume of ATP shipments at PMSL, 2005-2009: 6.4 million tons.
  - CAGR of ATP shipments, 2005-2009: -3 percent.
- Volume of ATP at PMSL, 2009: 1.2 million tons.
  - Volume of receipts, 2009: 95,200 tons.
    - Percentage of total PMSL volume receipts: 8 percent.
    - 2009 PMSL receipts as a percent of 2009 U.S. imports: 13 percent.
  - Volume of shipments, 2009: 1.1 million tons.
    - Percentage of total PMSL volume shipments: 92 percent.
    - 2009 PMSL shipments as a percentage of 2009 U.S. exports: 61 percent.

Summary: PMSL ships more asphalt, tar and pitch than it receives, although both segments experienced declining growth from 2005 to 2009. In 2009, PMSL's shipments accounted for over 60 percent of all U.S. exports.

Bottom Line: PMSL is a major player in the national asphalt, tar and pitch market, although its volumes declined over a recent five year period.

There is no record of asphalt, tar and pitch volumes at MRT Inc over the period 2000-2010.

5. Sand and Gravel

Sand and gravel has a variety of uses, including road and railroad development. The petroleum industry injects sand into oil wells as part of the oil extraction process. It is also used in foundry and automotive industry applications.

U.S. (National) Volumes

- Volume of U.S. sand and gravel imports and exports, 2005-2009: 17.5 million tons.
  - CAGR of sand and gravel (both directions), 2005-2009: -9 percent.
- Volume of sand and gravel imports, 2005-2009: 2.5 million tons.
  - CAGR of sand and gravel imports, 2005-2009: -33 percent.
- Volume of sand and gravel exports, 2005-2009: 15 million tons.
  - CAGR of sand and gravel exports, 2005-2009: -6 percent.
- Volume of U.S. sand and gravel imports, 2009: 95,000 tons.
- Volume of U.S. sand and gravel exports, 2009: 2.2 million tons.
  - Leading states, in order of tonnage produced, were Texas, Illinois, Wisconsin, Minnesota, Oklahoma, California, North Carolina, and Michigan. Combined production from these states represented 61% of the domestic total. In 2009, the United States was the world's leading producer and consumer of industrial sand and gravel.[14]

Summary: The U.S. exported much more sand and gravel than it imported from 2005 to 2009, though volumes in both sectors declined over the period. Illinois and Minnesota are producers of note to a Mississippi River terminal, as their products can be barged down the Mississippi for export to destinations abroad.

Bottom Line: Sand and Gravel has been a declining market, though the location of major producing states does offer potential for Mississippi River terminals in the export market.

PMSL Volumes

- Volume of sand and gravel (both directions) at PMSL, 2005-2009: 6.8 million tons.
  - CAGR of sand and gravel (both directions), 2005-2009: 0 percent.
- Volume of sand and gravel receipts at PMSL, 2005-2009: 547,343 tons.
  - CAGR of sand and gravel receipts, 2005-2009: -10 percent.
- Volume of sand and gravel shipments at PMSL, 2005-2009: 363,010 tons.
  - CAGR of sand and gravel shipments, 2005-2009: 51 percent.
- The vast majority of sand and gravel at PMSL is classified as "inter-port" cargo.
- Volume of sand and gravel at PMSL, 2009: 270,969 tons.
  - Volume of receipts, 2009: 100,875 tons.
    - Percentage of total PMSL volume receipts: 37 percent.
    - 2009 PMSL receipts as a percentage of 2009 U.S. imports: 106 percent (see comment below).
  - Volume of shipments, 2009: 170,094 tons.
    - Percentage of total PMSL volume shipments: 63 percent.
    - 2009 PMSL shipments as a percentage of 2009 U.S. exports: 7.7 percent.

Summary: While PMSL handled large volumes of sand and gravel from 2005 to 2009, nearly 90 percent of the volume was "inter-port" cargo, which most likely refers to dredging material. This would explain why PMSL receipts in 2009 would appear to be greater than U.S. imports in that year. Shipments in 2009 accounted for 8 percent of U.S. exports.

Bottom Line: PMSL's sand and gravel trade involves the transfer of material from one port to another. A minor market share may point to the transport of the commodity from production sources in Illinois and Minnesota to the Port of New Orleans for export markets.

MRT Volumes:

Beginning in 2006, increasing amounts of sand have been trucked into the terminal and transferred to rail for transport to petroleum facilities. With an average of 42,138 tons per year from 2007 to 2009, sand has quickly become a top 5 commodity at the terminal on an annual basis. There is strong competition for sand transport from other terminals at PMSL, including Cahokia Marine Service and Phoenix Terminal.

14. http://minerals.usgs.gov/pubs/commodity/silica/mcs-2010-sandi.pdf

- Volume of sand and gravel at MRT (outbound), 2005-2009: 134,191 tons.
  - Volume of sand and gravel at MRT as a percentage of total PMSL sand and gravel, 2005-2009: 2 percent.
  - CAGR of sand and gravel at MRT, 2005-2009: n/a
  - 99 percent trucked inbound.
  - 100 percent railed outbound.
- Volume of outbound sand and gravel, 2009: 31,236 tons.
  - MRT outbound volumes as a percentage of PMSL receipts: 12 percent.
  - MRT outbound volumes as a percentage of PMSL shipments: 18 percent.

Summary: MRT's sand volumes amounted to 2 percent of the volume at PSML from 2005 to 2009. The sand was mostly trucked in and railed out; no barge transportation was used. In 2009, MRT's sand volumes equaled 12 percent of PMSL receipts and 18 percent of shipments.

Bottom Line: The fact that the sand is trucked in and railed out of the terminal suggests that it acts more as a storage and transfer facility than an import/export terminal.

6. Cement and Concrete

U.S. (National) Volumes

- Volume of U.S. cement imports and exports, 2005-2009: 105 million tons.
  - CAGR of cement (both directions), 2005-2009: -26 percent.
- Volume of cement imports, 2005-2009: 101 million tons.
  - CAGR of cement imports, 2005-2009: -27 percent.
- Volume of cement exports, 2005-2009: 4.1 million tons.
  - CAGR of cement exports, 2005-2009: 3 percent.
- Volume of U.S. cement imports, 2009: 6.2 million tons.
  - Import sources (2005-2008): China, 22 percent; Canada, 19 percent; Republic of Korea, 9 percent; Thailand, 7 percent; and other, 43 percent.
- Volume of U.S. cement exports, 2009: 884,000 tons.
  - In descending order, Texas, California, Missouri, Pennsylvania, Alabama, and Michigan were the six leading cement-producing States and accounted for about 50 percent of 2009 U.S. production.[15]

Summary: The U.S. trade in cement is dominated by imports. From 2005 to 2009, imports declined at a CAGR of 27 percent while exports grew at 3.1 percent. The main import sources are China and Canada. Major domestic producers include Missouri and Alabama.

Bottom Line: A Mississippi River terminal could transport cement produced regionally, for example in Missouri or Alabama, to domestic or foreign destinations.

PMSL Volumes

- Volume of cement and concrete (both directions) at PMSL, 2005-2009: 6.1 million tons.
  - CAGR of cement and concrete (both directions), 2005-2009: -9 percent.
- Volume of cement and concrete receipts at PMSL, 2005-2009: 1.4 million tons.
  - CAGR of cement and concrete receipts, 2005-2009: -1 percent.
- Volume of cement and concrete shipments at PMSL, 2005-2009: 2 million tons.
  - CAGR of cement and concrete shipments, 2005-2009: -3 percent.
- Volume of cement and concrete at PMSL, 2009: 523,036 tons.
  - Volume of receipts, 2009: 252,461 tons.
    - Percentage of total PMSL volume receipts: 48 percent.
    - 2009 PMSL receipts as a percentage of 2009 U.S. imports: 4 percent.
  - Total volume of shipments, 2009: 270,575 tons.
    - Percentage of total PMSL volume shipments: 52 percent.
    - 2009 PMSL shipments as a percentage of 2009 U.S. exports: 31 percent.

Summary: PMSL had 1.4 million tons of receipts and 2 million tons of shipments from 2005 to 2009. Growth in both segments was stagnant or declined over the period. In 2009, shipments and receipts were in balance, though shipments accounted for a greater portion of U.S. exports (31 percent) than receipts did of U.S. imports (4 percent).

Bottom Line: PMSL shipped and received cement in fairly equal volumes. Its proximity to cement producing states like Missouri and Alabama may have sustained the growth of this market.

There is no record of cement and concrete being transported at MRT from 2000 to 2010.

7. Fish Meal / Nitrogenous Fertilizer

U.S. (National) Volumes:

- Volume of U.S. nitrogenous fertilizer imports and exports, 2005-2009: 14.5 million tons.
  - CAGR of nitrogenous fertilizer (both directions), 2005-2009: -13 percent.
- Volume of nitrogenous fertilizer imports, 2005-2009: 14 million tons.
  - CAGR of nitrogenous fertilizer imports, 2005-2009: -15 percent.
- Volume of nitrogenous fertilizer exports, 2005-2009: 493,452 tons.
  - CAGR of nitrogenous fertilizer exports, 2005-2009: 33 percent.
- Volume of U.S. nitrogenous fertilizer imports, 2009: 1.5 million tons.
  - Russia is the largest supplier, at 45 percent, followed by Canada at 28 percent.
- Volume of U.S. nitrogenous fertilizer exports, 2009: 244,815 tons.

Summary: The U.S. imports much more nitrogenous fertilizer than it exports, although its exports grew very rapidly while imports declined from 2005 to 2009. Russia and Canada are the largest suppliers of nitrogenous fertilizer to the U.S.

15. http://minerals.usgs.gov/pubs/commodity/cement/mcs-2010-cemen.pdf

Bottom Line: Nitrogenous fertilizer is not a huge market in terms of tonnage, and the largest segment- imports- has been declining over time.

PMSL Volumes:

- Volume of nitrogenous fertilizer (both directions) at PMSL, 2005-2009: 2.2 million tons.
  - CAGR of nitrogenous fertilizer (both directions), 2005-2009: 5 percent.
- Volume of nitrogenous fertilizer receipts at PMSL, 2005-2009: 2.2 million tons.
  - CAGR of nitrogenous fertilizer receipts, 2005-2009: 5 percent.
- Volume of nitrogenous fertilizer shipments at PMSL, 2005-2009: 22,998 tons.
  - CAGR of nitrogenous fertilizer shipments, 2005-2009: -100 percent
- Volume of nitrogenous fertilizer at PMSL, 2009: 472,570 tons.
  - Volume of receipts, 2009: 469,370 tons.
    - Percentage of total PMSL volume receipts: 99 percent.
    - 2009 PMSL receipts as a percentage of 2009 U.S. imports: 31 percent.
  - Volume of shipments, 2009: 0.
    - Percentage of total PMSL volume shipments: 0.
    - 2009 PMSL shipments as a percentage of 2009 U.S. exports: 0 percent.

Summary: PMSL experienced 5 percent growth in nitrogenous fertilizer trade from 2005 to 2009, with 2.2 million tons (virtually all receipts) handled over the time period. In 2009, it accounted for 31 percent of U.S. imports of the commodity.

Bottom Line: Despite a national decline in imports, PMSL saw growing volumes of nitrogenous fertilizer imports.

MRT Volumes:

Fish meal has averaged slightly less than 20,000 inbound tons per year at MRT since it was first recorded in 2001, but it has been brought to the terminal in fairly consistent volumes. It is barged to the terminal from the Port of New Orleans and then trucked out, presumably to agricultural facilities, as Missouri has the second highest number of farms in the country. There are at least three other terminals specializing in fertilizer at PMSL.

- Total volume of fish meal at MRT (outbound), 2005-2009: 56,915 tons.
  - Volume of fish meal at MRT as a percent of total PMSL nitrogenous fertilizer, 2005-2009: 2.6 percent.
  - CAGR of fish meal at MRT, 2005-2009: 23 percent.
  - 100 percent barged inbound.
  - 100 percent trucked outbound.
- Total volume of outbound fish meal, 2009: 19,573 tons.
  - MRT outbound volumes as a percent of PMSL receipts: 4 percent.

Summary: Fish meal grew at CAGR of 23 percent at MRT from 2005 to 2009, though it only accounted for 2.6 percent of nitrogenous fertilizer at PMSL over the period. Its share of PMSL receipts was 4 percent in 2009.

Bottom Line: MRT's fish meal receipts grew much more rapidly than PMSL's over the period 2005-2009, but its volumes constituted very little of the port's overall trade in the commodity. This suggests that there are other terminals with a strong customer base in this market.

8. Salt

U.S. (National) Volumes[*16]

- Total volume of U.S. salt imports and exports, 2004-2008: 56.7 million tons.
  - CAGR of salt (both directions), 2004-2008: -4 percent.
- Volume of salt imports, 2004-2008: 52 million tons.
  - CAGR of salt imports, 2004-2008: -3 percent.
- Volume of salt exports, 2004-2008: 4.6 million tons.
  - CAGR of salt exports, 2004-2008: -6 percent.
- Volume of U.S. salt imports, 2008: 10 million tons.
  - Import sources: Canada, 39 percent; Chile, 28 percent; The Bahamas, 9 percent; Mexico, 9 percent; and other, 15 percent.
- Volume of U.S. salt exports, 2008: 800,000 tons.

Summary: The U.S. imports much more salt than it exports. The salt trade shrunk over the period 2004-2008. Canada is the largest supplier of salt to the U.S.

Bottom Line: The U.S. has strong demand for salt, although this demand has been decreasing over time.

PMSL Volumes:[*17]

- Volume of non-metallic mineral (NEC) (both directions) at PMSL, 2005-2009: 2 million tons.
  - CAGR of non-metallic mineral (NEC) (both directions), 2005-2009: 8 percent.
- Volume of non-metallic mineral (NEC) receipts at PMSL, 2005-2009: 2 million tons.
  - CAGR of non-metallic mineral (NEC) receipts, 2005-2009: 8 percent.
- Volume of non-metallic mineral (NEC) shipments at PMSL, 2005-2009: 12,307 tons.
  - CAGR of non-metallic mineral (NEC) shipments, 2005-2009: 32 percent
- Volume of non-metallic mineral (NEC) at PMSL, 2008: 661,800 tons.
  - Volume of receipts, 2008: 660,400 tons.
    - Percentage of PMSL volume receipts: 99 percent.
    - 2009 PMSL receipts as a percentage of 2009 U.S. imports: 1.3 percent.
- Volume of shipments, 2008: 1,400 tons.
  - Percentage of total PMSL volume shipments: 1 percent.

*[*16] 2009 volumes not available, therefore data from 2004-2008 has been used.*
*[*17] There was no record of salt tonnage at PMSL per USACE accounts, therefore these volumes refer to non-metallic mineral (NEC) in the accounts.*

Summary: PMSL specialized in the receipt of non-metallic minerals from 2005-2009, which grew at 8 percent CAGR over the period. However, PMSL's market share of total U.S. imports of salt was only 1.3 percent in 2008.

Bottom Line: Despite strong growth in the receipt of non-metallic minerals, PMSL did not significantly factor into the national market.

MRT Volumes:

According to MRT, the terminal gets three to six salt barges per month and roughly 40,000 to 50,000 tons is stockpiled. The data show that salt has been a fairly consistent commodity at the terminal over the past decade. Bussen Terminal, American Milling Co., and Lange-Stegmann also handle salt at PMSL, thus there is strong competition for the transportation of this commodity.

- Volume of salt at MRT (outbound), 2005-2009: 1.1 million tons.
  - Volume of salt at MRT as a percent of total PMSL salt, 2005-2009: 55 percent.
  - CAGR of salt at MRT, 2005-2009: 11 percent.
  - 96 percent barged, 3 percent trucked inbound.
  - 98 percent trucked, 2 percent barged outbound.
- Volume of outbound salt, 2009: 243,214 tons.
  - MRT outbound volumes as a percent of PMSL receipts: 37 percent.

Summary: Salt volumes at MRT accounted for 55 percent of PMSL salt volume from 2005 to 2009, and grew more rapidly than PMSL's salt volume grew. MRT's share of PMSL receipts was 37 percent in 2009.

Bottom Line: MRT was an important terminal for the transport of salt at PMSL, but despite strong growth it appeared to lose market share over the period 2005 to 2009.

9. Iron and Steel Scrap

U.S. (National) Volumes:

- Volume of U.S. metal scrap imports and exports, 2005-2009: 106.7 million tons.
  - CAGR of metal scrap (both directions), 2005-2009: 9 percent.
- Volume of metal scrap imports, 2005-2009: 18.9 million tons.
  - CAGR of metal scrap imports, 2005-2009: -5 percent.
- Volume of metal scrap exports, 2005-2009: 87.8 million tons.
  - CAGR of metal scrap exports, 2005-2009: 12 percent.
- Volume of U.S. metal scrap imports, 2009: 3 million tons.
- Volume of U.S. metal scrap exports, 2009: 22.4 million tons.
  - U.S. is largest scrap metal exporter in the world.
  - China was the largest importer from the U.S., at 6.2 million tons.
    - Increase of 120 percent from 2008.
  - Turkey was second at 3.7 million tons.
  - Korea and Taiwan were third and fourth, at 3.4 million and 2.4 million tons.

Summary: The U.S. exports much more scrap metal than it imports, and exports grew at a rapid pace from 2005 to 2009. China was the biggest buyer in 2009.

Bottom Line: The U.S. scrap metal export market is huge, and should grow as the biggest buyer is one of the world's largest developing nations.

PMSL Volumes:

Several metal scrap dealers are located within or near PMSL, including Grossman Iron & Steel, the largest purchaser and processor of scrap metal in the St. Louis area. Grossman's scrap processing facility covers 22 acres. It handles all metals, from iron and steel to various grades of copper, aluminum, brass, stainless steel and specialty alloys, collecting the metal in containers at industrial sites throughout Illinois and Missouri. The company processes the metal and then sells it to steel mills and foundries.[18]

Despite a big decline during the recent recession, steel production remains a viable industry; U.S. Steel's Granite City Works plant recently restored full production capacity after laying off as many as 1,600 workers in 2008.[19]

- Volume of metal scrap (both directions) at PMSL, 2005-2009: 1.8 million tons.
  - CAGR of metal scrap (both directions), 2005-2009: 2 percent.
- Volume of metal scrap receipts at PMSL, 2005-2009: 45,752 tons.
  - CAGR of metal scrap receipts, 2005-2009: -18 percent.
- Volume of metal scrap shipments at PMSL, 2005-2009: 1.8 million tons.
  - CAGR of metal scrap shipments, 2005-2009: 2 percent.
- Volume of metal scrap at PMSL, 2009: 383,265 tons.
  - Volume of receipts, 2009: 4,797 tons.
    - Percentage of total PMSL volume receipts: 1 percent.
    - 2009 PMSL receipts as a percentage of 2009 U.S. imports: 0.1 percent.
  - Total volume of shipments, 2009: 377,068 tons.
    - Percentage of total PMSL volume shipments: 98 percent.
    - 2009 PMSL shipments as a percent of 2009 U.S. exports: 1.7 percent.

Summary: PMSL exports a large amount of scrap metal, although it only has 1.7 percent market share of the U.S. scrap metal export market.

<u>Bottom Line</u>: PMSL's scrap metal exports did not grow as quickly as that of the U.S. overall from 2005-2009.

18. http://www.partslocator.com/news/back.issues/article.details asp?ArticleID=1208s

19. http://wwwbnd.com/2011/03/12/1627275/amsted-is-bouncing-back-from-big-html

MRT Volumes:

- Volume of metal scrap at MRT (outbound), 2005-2009: 902,835 tons.
- Volume of metal scrap at MRT as a percentage of total PMSL metal scrap, 2005-2009: 50 percent.
  - CAGR of metal scrap at MRT, 2005-2009: 9 percent.
  - 96 percent trucked, 4 percent barged inbound.
  - 94 percent barged, 5 percent trucked outbound.
- Volume of outbound metal scrap, 2009: 233,777 tons.
  - MRT outbound volumes as a percentage of PMSL shipments: 62 percent.

Summary: MRT was a major player in the scrap metal export market at PMSL, with 50 percent market share over the period 2005-2009 (and 62 percent in 2009). Growth of scrap metal exports grew faster at MRT than they did at PMSL.

Bottom Line: Much of MRT's metal scrap business is associated with the Grossman operation.

10. Coke (Pet Coke, Coal Coke)

U.S. (National) Volumes

- Volume of U.S. coke imports and exports, 2005-2009: 22 million tons.
  - CAGR of coke (both directions), 2005-2009: -21 percent.
- Volume of coke imports, 2005-2009: 14 million tons.
  - CAGR of coke imports, 2005-2009: -37 percent.
- Volume of coke exports, 2005-2009: 8 million tons.
  - CAGR of coke exports, 2005-2009: -6 percent.
- Volume of U.S. coke imports, 2009: 347,000 tons.
  - Virgin Islands has been the biggest source of petroleum coke imports since 2005, followed by Aruba and Canada.
- Volume of U.S. coke exports, 2009: 1.3 million tons.
  - U.S. exports 441,000 b/d of petroleum coke.[20]
  - Biggest buyer is Japan, followed by Mexico, Brazil and Spain. China ranks 7th but its purchases grew at CAGR of 38 percent from 2005-2010.

Summary: The U.S. imports and exports coke, a by-product of the petroleum production process, though its trade decreased by a CAGR of 21 percent from 2005 to 2009. The biggest source of imports is the Caribbean. Japan is the biggest buyer of exports, though Brazil and Spain are also on the list.

Bottom Line: While not a growing market, coke is still a fairly sizable trade with strong foreign demand.

PMSL Volumes

- Total volume of coke (both directions) at PMSL, 2005-2009: 2.9 million tons.
  - CAGR of coke (both directions), 2005-2009: -20 percent.
- Volume of coke receipts at PMSL, 2005-2009: 2.4 million tons.
  - CAGR of coke receipts, 2005-2009: -30 percent.
- Volume of coke shipments at PMSL, 2005-2009: 503,788 tons.
  - CAGR of coke shipments, 2005-2009: 1 percent.
- Volume of coke at PMSL, 2009: 190,616 tons.
  - Volume of receipts, 2009: 82,680 tons
    - Percentage of total PMSL volume that was receipts: 43 percent.
    - 2009 PMSL receipts as a percentage of 2009 U.S. imports: 24 percent.
  - Volume of shipments, 2009: 107,936 tons.
    - Percentage of total PMSL volume shipments: 57 percent.
    - 2009 PMSL shipments as a percent of 2009 U.S. exports: 8.3 percent.

Summary: PMSL handled nearly 3 million tons of coke from 2005 to 2009, most of which was receipts. Its volumes declined by 20 percent CAGR over the period, on average, roughly in line with national declines. In 2009, receipts at PMSL accounted for one-quarter of U.S. imports, while shipments accounted for 8 percent of U.S. exports.

Bottom Line: PMSL has considerable market share in the coke import market, and also a minor role in the coke export market.

MRT Volumes:

- Volume of coke at MRT (outbound), 2005-2009: 55,275 tons.
- Volume of coke at MRT as a percentage of total PMSL coke, 2005-2009: 2 percent.
  - CAGR of coke at MRT, 2005-2009: n/a.
  - 76 percent barged, 24 percent trucked inbound.
  - 76 percent trucked, 24 percent barged outbound.
- Volume of outbound coke, 2009: 5,204 tons.
  - MRT outbound volumes as a percentage of PMSL receipts: 6 percent.
  - MRT outbound volumes as a percentage of PMSL shipments: 4.8 percent

Summary: MRT handled over 50,000 tons of coal from 2005 to 2009, which accounted for 2 percent of total PMSL volume over the time period. The fact that ¾ of its trade is barged and ¼ trucked inbound (and vice versa for outbound) suggests that it is part of both the receipt and shipment flows. MRT's 2009 volume represented around 5 percent of either receipts or shipments at PMSL.

Bottom Line: MRT does not have strong market share of the coke market, and the national as well as local decline in coke volumes over a recent five-year period does not offer compelling reasons for it to look to expand its market share.

20. http://www.platts.com/weblog/oilblog/2010/05/09/us_oil_exp.

LOW VOLUME COMMODITIES AT PMSL

The following commodities were not transported in high volume at PMSL from 2005 to 2009, although some of them were transported at MRT over the time period.

Aluminum Process Residue: Aluminum process residue, the by-product of the production process, has been trucked to the terminal and barged out over the past decade. Although similar to iron and steel scrap in nature, aluminum has not been transported at the terminal very consistently. In fact, only 24,855 inbound tons were transported in the past five years, compared to 165,268 tons in the first five years of the decade.

The lack of consistent volumes, combined with competition from three other terminals in the scrap metal transport market at PMSL, suggests that this is not a strong prospect for MRT.

Bauxite: Bauxite is imported from various places and generally transported to the terminal by truck or rail. It is an ore, similar to aluminum, usually exported to foreign countries for use in automotive, aviation, bottling and canning, kitchen cookware, building construction and consumer products. Bauxite has not been transported consistently at the terminal, with some years showing no record of inbound volumes, while other years showing as much as 37,000 tons (2001).

Since bauxite is very similar to aluminum in terms of its tonnage history at the terminal, the same arguments apply with regards to its prospects for the MRT.

Ferro Manganese and Magnetite: These two are grouped together because, per MRT, they are both barged to the terminal and then trucked out to the local U.S. Steel plant. Magnetite ore is processed into iron ore for use in steel production at the mill. Ferro manganese tonnage has been more consistent over the past decade than magnetite (which only appeared from 2005 onwards); however, magnetite is transported in nearly twice as much volume, on average, per year.

Neither ferro manganese nor magnetite account for a significant volume at the terminal, averaging 2-4 percent of total volume over the past decade. Given that there is a single buyer of the commodity, there is high risk that magnetite and ferro manganese volumes at MRT could disappear entirely if the U.S. Steel plant shuts down. Nonetheless, ferro manganese and magnetite volumes are considered in the market forecast.

Liquid Bulk: Liquid bulk commodities include mineral oils, chemicals, vegetable oils, asphalt, and crude petroleum. Liquid bulk commodities accounted for 18 percent of cargo at PMSL in 2009.

Since 2005, MRT has not been permitted to handle hazardous liquid bulk materials. This may be due to its tanks being in a state of disrepair. The existence of the tank does suggest that, with some improvements, the terminal could handle liquid bulk again. However, prior to 2005, the terminal did not handle large volumes of liquid bulk commodities.

According to TranSystems, 22 other terminals were handling liquid bulk at PMSL in 2010. Some of these are listed in *Table 1.3*. The majority of these handle petroleum products and liquid chemicals.

The low volumes at MRT, combined with strong competition from existing liquid bulk terminals, suggest that liquid bulk is not a good prospect for the MRT. However, since PMSL has nearly 50 percent of the national market in asphalt, the prospects for this commodity at MRT may be considered.

Containers-on-Barge (COB): The COB mode of transport has been implemented successfully in Northern Europe and the Northwest U.S.. However, it has failed to gain traction on the Mississippi River, as demonstrated by the historical throughput statistics for PMSL. This section discusses the pros and cons of COB in general, and at MRT in particular, and concludes that it does not appear to have strong prospects for adoption going forward.

A successful COB service must be efficient and cost-effective in the following areas:

- Terminal operations.
- Barge delivery schedules.
- Container/chassis equipment control/repair.
- Security, insurance and risk control systems.
- Communications systems.
- Marketing.

The primary arguments in favor of COB are:

- COB uses less fuel than rail or truck. One study says that a single gallon of fuel can move one ton of goods 514 miles by barge, compared to 59 miles by truck and 202 miles by rail.[21]
- COB causes less congestion than truck transportation.
- One barge trip is equal to 58 truck trips (in terms of its ability to move a certain amount of commodities over a specified distance).
- The combination of less fuel usage and less congestion means that COB introduces fewer pollutants into the environment than rail or truck.
- COB is less likely to have an accident than either rail or truck, and when accidents do occur, they are less likely to result in loss of life, damage to goods being transported, or disruption to the greater transportation network.[22]
- The introduction of COB will result in increased competition for the transportation of containers, driving down rail and truck freight rate.
- COB can expand the reach of small terminals and ports with poor land-side access.

21. Bomba, Michael and Harrison, Robert: "Feasibility of a Container-on-Barge Network Along the Texas Gulf Coast"

22. Connecticut Department of Transportation, "Container Barge Feeder Service Study". The Office of Inter-Modal Planning, March 2001.

The primary arguments against COB are:

- COB is not an efficient mode of transporting containers.
- River barges tend to move more slowly and can face more time-consuming obstacles than either rail or truck.
- Inventory stuck on slow barges represents a cost to the supply chain and does not fit with the Just-in-Time model.
- COB results in double handling of containers, as containers are handled at both an ocean port and a barge terminal. This results in more time and expense (since barge terminals and ocean ports have similar fees) than the traditional mode of ocean port directly to rail or truck.
- Storing and handling of containers is expensive and requires high capital investment up front. Container cranes alone can range in cost from $750,000 to $1.5 million each. The dedicated space used to store containers also represents a significant opportunity cost (and risk) to terminals.
- The "Chicken and Egg Syndrome": Container shippers are reluctant to commit cargo for a service that the barge lines do not offer on a predictable, regular and reliable basis, while barge lines are reluctant to commit barges to a service without the guarantee of sufficient cargo.[23]
- The Jones Act restricts COB operations, requiring that domestic cabotage be restricted to U.S.-owned, U.S.-built and U.S.-manned vessels. It also requires that the container itself be built in the U.S. or be imported with duties paid. Potential operators have stated that this legislation increases their costs significantly, stating that it would be cheaper to build vessels abroad. There is also a lack of barges with the capability to handle containers, and retrofitting existing barges can be expensive.

The above arguments pertain to the general use of COB. Looking more closely at MRT, the terminal itself offers pros and cons for the transportation of containers:

Arguments in favor of transporting containers at MRT include:

- The terminal has both rail and truck access. Its intermodal capability would allow it to transport containers to/from the terminal fairly easily.
- MRT would be the only terminal with container handling and storage capability at PMSL. As a monopoly service provider, it would enjoy market power.

Arguments against transporting containers at MRT include:

- Extensive dedicated storage space would be required for container operations and could not be used for handling other commodities. The MRT would face significant risk, essentially trading in the "safe" bet of in-demand commodities such as metal scrap for the riskier one of containers.
- MRT would have to be the "chosen" interchange point in the supply chain network for beneficial cargo owners. It is not clear that the MRT has any particular technical advantage over other sites on the Mississippi River.

COB has been attempted on the Mississippi River before. As recently as the 1990s, refrigerator compressors from Brazil were unloaded at the Port of New Orleans and then shipped upstream via barge to Illinois. However, the service was hindered by strong competition from the rail network, which cut rates aggressively. Ultimately the reliance upon a single shipper hurt the COB operators, which did not have the deep pockets to survive a price war against the rail operators.

In sum, there are arguments for and against COB, a model that has been successfully employed in some parts of the world though not on the Mississippi River. In the context of the MRT, the cost and risk of becoming a container handling and storage operation far outweigh the benefits, which include the opportunity to enjoy a monopolistic position.

Ultimately, if COB was a reliable, efficient, and cost-effective model, the market would currently be initiating efforts to undertake container transport on the Mississippi River; however, this has not happened in nearly two decades. This helps in discounting the possibility of transporting containers at MRT.

Much attention continues to be given to the impressive expansion plans for the Panama Canal. Construction continues apace and to schedule. While the Panama Canal accommodates all types of vessels, the main rationale for the expansion is to satisfy the ever growing number of container vessels being introduced into the world trades – the Canal's current dimensions exclude the largest container ships. These vessels are the Panama Canal Authority's main revenue generator and will remain the Authority's primary focus going forward.

The expansion of the Canal will enable the larger vessels to ply direct eastbound routes from Asia, primarily China, to the U.S. Gulf and East Coasts. The expectation is that some of the larger container handling ports, such as Houston, will take market share from the Ports of Long Beach and Los Angeles on the West Coast. It is also possible that some of the container transshipment hubs in the Caribbean, such as Kingston in Jamaica and Caucedo in the Dominican Republic, will be major beneficiaries with boxes being fed to/from the U.S. and destinations in South America.

What is important is the emphasis on containers. As discussed, for a variety of reasons this is not a market best suited to the MRT operation.

23. McCarville, James R., "Container-on-Barge Pre-Feasibility Study". Port of Pittsburgh Commission, July 2003.

Distiller's Dried Grains with Solubles (DDGs): DDGs are a high nutrient feed for livestock and a co-product of the distillery industries. Approximately 3.2 to 3.5 million tons of DDGs are produced annually in North America, with most coming from plants that produce ethanol for oxygenated fuels.

About 700,000 tons of North American DDGs are exported to the European Union, Mexico, and China, while 2.65 million tons remains for domestic use in the U.S. and Canada. [24] The U.S. ships DDGs to China from sources in California extending to Nebraska and the Mississippi River.[25]

As a dry bulk cargo commodity, DDGs is very similar to grain or fish meal; indeed, DDGs has replaced fish meal for some feed applications.[26] However, it is very difficult to forecast future transport of DDGs as a stand-alone commodity, due to the lack of historical data and published information about DDG volumes on the Mississippi River. It is apparent that DDGs has potential for transportation at MRT and for this reason, this commodity is included in the market forecast.

Project Cargo and "Green" Manufacturing: Project cargo generally refers to large construction and plant equipment that requires special handling. It is usually brought in on a "one-off" basis, and includes such items as massive generators for manufacturing plants, which are suitable for barge transport.

Green manufacturing includes pre-manufactured components, machinery and equipment that has minimal impact on the environment, or is used for the purposes of generating environmentally-friendly products (such as wind farm components).

Several of the terminals listed in *Table 1.4* are capable of handling project cargo and green manufacturing, including MRT. However, as these cargo types have not historically been classified as stand-alone commodities, there are no individual records of their volumes at PMSL. For example, the category of "Manufactured Equipment, Machinery and Products" in USACE's records for PMSL includes everything from vehicle parts to textile products.

Barge transportation is an attractive mode of transportation for green manufacturing, since barges emit fewer pollutants than rail or truck (for the same volume of cargo carried over the same distance). Barges can also be an effective way to carry project cargo, as many have been specially designed to handle large equipment.

The growth of project cargo is tied to the growth of industry as a whole along the Mississippi River and surrounding regions, whereas the growth of green manufacturing is driven by an interest in creating a more sustainable footprint for such industrial production.

Without a separate forecast for industrial growth in the region, and without any historical data for the volumes of project cargo and green manufacturing on the Mississippi River, it is difficult to forecast future volumes for these cargo types at MRT. Nonetheless, project cargo and green manufacturing present an opportunity for MRT.

PEST Analysis

This section contains an assessment of factors that could impact the Port of St. Louis (and consequently all terminals located there including the MRT) in the future, separated into four categories: Political, Economic, Social and Technological.

POLITICAL

Environmental Rules: Extensive processes to ensure compliance with environmental rules could delay, halt, or cancel plans for any further development at the terminals or plans to transport certain types of commodities.

Grants for River Cargo Carriage: Grants will allow for investment in safety and security measures as well as better physical infrastructure (new locks), which will increase opportunities for barge shippers.

Regulatory Change e.g. Jones Act: A relaxation of the Jones Act would allow for competition in the cabotage arena, thereby driving transport costs lower and allowing more commodities to be transported by barge.

Fuel Tax Hike: A change in fuel tax would change the competitiveness of barge transport relative to rail and truck. Currently, barge is among the most fuel efficient modes of transportation, so an increase in fuel costs would make barge more cost competitive than either rail or truck.

ECONOMIC

Global Trade: Trade between developed and developing nations will eventually move back towards a more balanced relationship, with U.S. exports gaining popularity in foreign markets (especially mining and agricultural commodities).

Local Economy: A strong local economy will spur demand for more goods that are transported by barge, thus increasing river traffic and constraining capacity at terminals; on the other hand, a weakening economy will diminish demand and not provide adequate ROI on terminal development projects.

Fuel Prices: Global fuel prices, determined by supply and demand as well as speculation, will impact the competitiveness of barge transport relative to rail and truck.

24. http://www.ddgs.umn.edu/overview.htm
25. http://global.chinafeedonline.com/global/info/news/show_news_detail.jsp?id=492223
26. http://www.allaboutfeed.net/news/ddgs-to-replace-fish-meal-in-japanese-aquafeed-id4476.html

Exchange Rate: Particular with regards to the U.S.-China exchange rate, a strengthening U.S. currency will make exports more expensive but imports more appealing, and vice versa for a weakened U.S. currency.

Inflation: An increase in the cost of inputs will decrease demand for imports from manufacturers; similarly for consumers, an increase in costs will slow growth in demand.

Interest Rates: An increase in interest rates may dampen demand on the part of local manufacturers and home builders.

SOCIAL

Environmental Responsibility: Environmental activists may oppose development projects or the transport of certain commodities at the Port due to perceived environmental impacts.

Corporate Governance: Private terminal owners and shippers may wish to improve their environmental credentials through the use of more energy efficient forms of transport, such as barges.

TECHNOLOGICAL

Vessel/Barge Size: An increase in vessel size may provide lower transportation costs through economies of scale, depending upon the River's and terminal's ability to accommodate the larger vessels.

Vessel Numbers: An increase in the number of vessels may constrain capacity on the part of terminals and create opportunities for competing ports to handle the increased traffic.

Equipment Changes: Terminals may not be adequately prepared to handle changes in goods movement equipment.

Security: The need to implement new security technology will increase operational costs.

The analysis shows that a number of factors could affect the Port in the future, either by impacting the demand for the commodities that are transported through the Port or by increasing the operating costs of the terminals at the Port. The Port does have the ability to control and/or influence some of these factors, for example, by more prudent environmental practices such as cold ironing. Cold Ironing is the term that ships use when they shut down their engines (let the iron get cold) and coast into the port.

However, PMSL does not have control over some of the factors mentioned. For example, it cannot affect the U.S.-China exchange rate and thus will feel the repercussions of any change in this index when it comes to the foreign demand for the commodities that are transported at PMSL Changes in economic or technological factors could also change the cost effectiveness of barge transportation relative to rail or truck transportation. This would alter the competitive balance of the terminals relative to other ports, rail terminals and inter-modal facilities.

MRT SWOT ANALYSIS

The following SWOT analysis identifies the Strengths, Weaknesses, Opportunities and Threats of the MRT, with a view towards determining market opportunities for the terminal.

STRENGTHS

Existing Infrastructure: Existing terminal with capability to handle a vast array of dry bulk, general cargo, project cargo and some liquid bulk. Existing customer relationships in these sectors.

Proximity: Close proximity to numerous industrial, manufacturing and distribution facilities (e.g. Grossman Iron & Steel) that rely upon barge transportation either for imports or exports.

Multi-Modal: True multi-modal facility with rail, truck and barge capability.

Barge Transportation: Barge transportation is the cheapest on a per-ton mile basis.

WEAKNESSES

Condition of Infrastructure: Poor condition of physical assets. Unable to handle liquid hazardous materials. Potential safety concerns, expensive renovation required.

Cargo Capability: Lacking the capability to handle certain types of cargo (containers, some liquid bulk).

Jones Act: The U.S. Jones Act makes cabotage expensive by limiting competition to U.S.-built, owned and manned vessels.

Lack of Local Beneficial Cargo Users: Despite presence of local distribution facilities, this terminal has not historically been used by Beneficial Cargo Owners.

OPPORTUNITIES

Location: To be a "hub of the hub" – a key multi-modal distribution facility at the heart of one of the national transportation hubs.

Foreign Demand: To capitalize upon high foreign demand for local products like grain, coal and iron scrap.

Infrastructure Potential: To develop the infrastructure necessary to accommodate future growth in a wide variety of potential cargos.

Environmentally Sensitive Potential: Ideal facility for the handling of environmentally sensitive products such as waste

Project Cargo Potential: Ideal for handling project cargo via barge transportation.

Revenue/ Manufacturing Potential: Increase revenue and attract manufacturing to the North Riverfront area.

THREATS

Competition: Strong competition along Mississippi River and even within Port of Metropolitan St. Louis

Mississippi River Flow: Flow of the Mississippi River can vary, limiting transportation of certain goods and at certain times of the year.

Shifting Modes: Shifting modes during handling increases the cost and erodes the cost advantage of barge transportation, making it difficult to compete with large ports for containers.

The SWOT analysis presents a balanced picture of the MRT's market position. Clearly, the terminal enjoys some strengths resulting from its history of operations serving primarily the dry bulk commodity market, its favorable geographic location and its multi-modal capabilities. These are, however, offset by its weaknesses, which include the poor current condition of physical assets and the lack of handling capability for certain types of cargo.

If the terminal can capitalize upon its strengths it could become a notable cargo handling terminal for the region. However, it may not achieve this goal if it cannot overcome certain threats- including strong competition from other terminals on the Mississippi and operational constraints which threaten to delay cargo and raise costs.

The terminal should be able to overcome its weaknesses and mitigate threats if it undergoes extensive infrastructure rehabilitation and development aimed at accommodating future growth in a viable but achievable range of cargo. The following section presents a forecast of selected cargo, chosen on the basis of the market analyses provided in the preceding sections.

MRT Forecast

METHODOLOGY

The analysis in the preceding sections showed that a few commodities have historically dominated tonnage at PMSL as well as the terminal itself. The top five commodities, by volume, accounted for 83 percent of the total volume at the terminal over the past ten years, while the top 10 commodities accounted for 93 percent of the total volume. The same ratios held true when the same analysis was carried out for the past five years of data.

Given the historical dominance of these commodities, it is expected that these will continue to account for a notable share of the MRT's throughput. These commodities, typically bulk and low value, are ideal for barge transport. However, the study team has not limited the forecast to what has previously been transported within the wider PMSL area. The results of the SWOT and PEST analysis also inform the forecasting approach.

Given the inapplicability of the econometric approach, the forecast for MRT was carried out in two steps. The first step involved the creation of a market forecast for the major commodities that were identified as having potential for both PMSL and MRT over the forecast period. The second step involved projecting MRT's volumes of those commodities and its share of PMSL volumes over the forecast horizon.

After Step 1, any commodities having a combination of the following conditions were discounted as prospects and not included in the forecast for MRT:

1. Very low projected volume
2. Very low projected growth
3. No history of being handled at the terminal

STEP 1: MARKET FORECAST

A table showing the Compound Average Growth Rate (CAGR) of major commodities at PMSL from 2005 to 2009, as well as the port's share of the national market in those commodities, is presented in Table 2.11. This recent historical data provides a good baseline context to the forecasting exercise.

The data show that certain commodities have grown nationally but not locally (e.g. grain), while others have grown locally but not nationally (e.g. fish meal, salt). However the majority seem to have trended in the same direction nationally and locally, though the rates of growth may have differed at each level. In order to predict the future direction of the growth for each commodity, the team

Commodity	PMSL Share of National Market	2005-2009 CAGR	
		U.S.	PMSL
Coal	12.7%	0.3%	2.0%
Iron & Steel Scrap	1.7%	9.0%	2.0%
Salt	3.5%	-4.0%	8.0%
Fish Meal / Nitrogenous Fertilizer	15.2%	-13.0%	5.0%
Grain	17.0%	10.0%	-1.0%
Asphalt, Tar and Pitch	47.5%	-2.0%	-4.0%
Coke	13.0%	-21.0%	-20.0%
Sand and Gravel	39.0%	-9.0%	0.0%
Oilseeds	11.2%	16.0%	11.0%
Cement and Concrete	5.8%	-26.0%	-9.0%

Table 2.11 - Historical Share and Growth of Major Commodities. Source: USACE, USGS

considered the various scenarios that might result in one of three cases (low, base or high). The potential scenarios are presented in *Table 2.12* on the following page.

Developing a long-term CAGR for each commodity at PMSL was the next step. Since these CAGRs run the twenty year forecast period, it was necessary to use very conservative rates- not exceeding 2 percent or else the volumes could grow to unrealistic levels. The important point to note here is that forecasts of this type are designed to understand the likely scale of physical development required to accommodate the cargoes. The market analyses for each commodity as well as consideration of various scenarios in *Table 2.12* helped in determining the potential rate and direction of growth. The projected market forecast growth rates are presented in *Table 2.13* on the following page.

Commodity	Low Case	Base Case	High Case
Coal	Drop in local demand as coal replaced by another fuel source.	Sustained local demand from local facilities.	Strong growth as coal becomes highly desired fuel source.
Grain	The cost of barge transportation for grain goes up relative to other modes.	Barges remain cost effective for the transportation of grain.	Barges become the most cost effective transport method.
Oilseeds	Regional producers begin transporting oilseeds directly to seaports for export.	Regional producers continue to use barge transportation.	Increase in demand from foreign buyers.
Asphalt, Tar and Pitch	Fuel costs rise, resulting in less production of asphalt, tar and pitch in Gulf region.	Sustained foreign demand and continued production in Gulf region.	High foreign demand and low fuel costs spur increased production in the Gulf region.
Sand and Gravel	Decline in activity produces less sand to transport.	Continued activity produces steady flow of sand to transport.	Increase in activity results in more sand to transport.
Cement and Concrete	Decline in demand from results in less production in the region.	Continued strong demand sustains high levels of production in the region.	Increased demand spurs greater production in the region.
Fish Meal / Nitrogenous Fertilizer	Fish meal demand declines as it is replaced by a different type of fertilizer.	Fish meal demand from regional farms remains strong.	Fish meal demand increases as the cost of other fertilizers goes up.
Salt	Salt is increasingly trucked instead of being barged.	Salt continues to be transported by barge to local industrial producers.	Strong demand increases the amount sent by barge to local industrial producers.
Iron & Steel Scrap	Local steel mills shut down; foreign production of scrap increases.	Local steel mills stay open, scrap still exported to foreign countries.	Local steel production expands and foreign demand increases.
Coke	Decline in demand from results in less production in the region.	Continued strong demand sustains high levels of production in the region.	Increased demand spurs greater production in the region.

Table 2.12 - Possible Scenarios for Base, Low and High Case-Market Size
Source: Halcrow

Commodity	PMSL Forecast CAGR - Low Case	PMSL Forecast CAGR - Base Case	PMSL Forecast CAGR - High Case
Coal	0.0%	0.5%	1.0%
Iron & Steel Scrap	0.5%	1.0%	2.0%
Salt	0.0%	0.5%	1.0%
Fish Meal / Nitrogenous Fertilizer	0.0%	0.5%	1.0%
Grain	-1.0%	0.0%	1.0%
Asphalt, Tar and Pitch	-1.0%	0.0%	0.5%
Coke	-1.0%	0.0%	0.5%
Sand and Gravel	0.0%	0.0%	0.0%
Oilseeds	0.5%	1.0%	2.0%
Cement and Concrete	0.0%	0.5%	1.0%

Table 2.13 - Market Forecast CACRs
Source: Halcrow

Table 2.13 shows long-term CAGRs that were applied to a starting year volume and then grown for each commodity over 20 years. For PMSL, the starting year volume was 2009 as this was the last year for which official data exists.

Commodity	PMSL Volume in 2009	PMSL Volume in 2030 - Low Case	PMSL Volume in 2030 - Base Case	PMSL Volume in 2030 - High Case
Coal	12,300,000	12,300,000	13,658,167	15,158,421
Iron & Steel Scrap	383,265	425,585	472,333	580,902
Salt	661,800	661,800	734,876	815,597
Fish Meal / Nitrogenous Fertilizer	472,570	472,570	524,751	582,391
Grain	5,100,000	4,129,612	5,100,000	6,285,199
Asphalt, Tar and Pitch	1,200,000	971,673	1,200,000	1,332,504
Coke	190,616	154,347	190,616	211,664
Sand and Gravel	270,969	270,969	270,969	270,969
Oilseeds	3,600,000	3,997,512	4,436,611	5,456,399
Cement and Concrete	523,036	523,036	580,790	644,585

Table 2.14- Market Forecast Volumes (Tons)
Source: Halcrow

Commodity	MRT Market Share of Commodity at PMSL, 2005-2009	2005-2009 CAGR		
		US	PMSL	MRT
Coal	0.5%	0.3%	2.0%	17%
Iron & Steel Scrap	50.0%	9.0%	2.0%	9.0%
Salt	55.0%	-4.0%	8.0%	11.0%
Fish Meal / Nitrogenous Fertilizer	2.6%	-13.0%	5.0%	23.0%
Grain	0.0%	10.0%	-1.0%	n/a
Asphalt, Tar and Pitch	0.0%	-2.0%	-4.0%	n/a
Coke	2.0%	-21.0%	-20.0%	2.0%
Sand and Gravel	2.0%	-9.0%	0.0%	2.0%
Oilseeds	0.0%	16.0%	11.0%	n/a
Cement and Concrete	0.0%	-26.0%	-9.0%	n/a

Table 2.15 - Historical Market Share and Growth of Major Commodities
Source: Beelman, USACE, USGS

Table 2.14 shows PMSL's volume in 2009, followed by the forecasted volume at PMSL in 2030 in each of the three cases- low, base and high-for each of the key commodities.

These volumes are in terms of one way, outbound only traffic.

STEP 2: MARKET SHARE FORECAST

The CAGR 2005-2009 of key commodities at MRT as well as its share of PMSL tonnage in these commodities is presented in *Figure 2.15*. This historical data help provide some context to the forecasted market share and growth numbers.

The data show that the terminal had no market share in grain, asphalt, tar and pitch, oilseeds, and cement/concrete. Additionally, it had very low growth in oilseeds and sand and gravel over the recent five-year period. The combination of low forecasted growth (*Table 2.13*), low forecasted volume (*Table 2.14*), and no current market share (*Table 2.15*) resulted in the elimination of the following commodities from the forecast for MRT:

- asphalt tar and pitch;
- coke;
- sand and gravel; and
- cement and concrete.

This is not to say that these commodities may never be handled at the MRT but that there are more suitable and/or attractive cargo types to consider.

The team considered various scenarios that may result in one of three cases (low, base or high) for the market in the key forecasted commodities at MRT. The potential scenarios are presented in *Table 2.16*.

Commodity	Low Case	Base Case	High Case
Coal	Strong competition results in a no gain in MRT's share of PMSL coal volumes.	Despite competition, MRT is able to gain slight share in the coal export market.	MRT enters the coal import market, gaining share from specialist terminals at PMSL.
Iron & Steel Scrap	Grossman Iron & Steel moves scrap export tonnage to a competing facility.	Grossman Iron & Steel continues to use MRT for majority of its scrap exports.	More scrap processors move export tonnage to MRT due to its low cost of handling.
Salt	Strong competition results in a decline in MRT's share of salt handling at PMSL.	Despite competition, MRT is able to maintain its strong share of the salt market.	Due to its lower cost of handling, MRT entices more buyers of salt to use the terminal for imports.
Fish Meal / Nitrogenous Fertilizer	Strong competition results in no gain in MRT's share of PSML fish meal volumes.	Despite competition, MRT is able to grow its market share in fish meal.	Due to its lower cost of handling, MRT entices more buyers of fish meal to use the terminal for imports.
Grain	No grain transported at MRT.	MRT gains a foothold in the grain export business, with 1% market share in 2012, followed by slow growth.	MRT gains a foothold in the grain export business, with 2% market share in 2012, followed by moderate growth.
Oilseeds	No oilseeds transported at MRT.	MRT gains a foothold in the oilseeds export business, with 1% market share in 2012, followed by slow growth.	MRT gains a foothold in the grain oilseeds business, with 2% market share in 2012, followed by moderate growth.

Table 2.16 - Scenarios for Base, Low and High Case-MRT Market Share
Source: Halcrow

The next step was to develop long-term market share growth rates for each commodity at MRT. It is important to note that these growth rates represent the growth or decline of MRT's market share in the commodity and not the growth in volume of the commodity.

Since the growth rates represent compounded growth over a twenty year forecast period, it was necessary to use very conservative rates- not exceeding 2 percent- or else the market share could grow to unrealistic levels.

For example, the City of St. Louis has expressed a desire to move away from metal scrap yards along the North Riverfront, even recently paying one iron and steel scrap business $1.75 million to leave the city, saying that it is interested in moving more light industry and service-oriented businesses into the area.

The forecast does not take into account the possibility of regulation that would stop the scrap trade at PMSL altogether. In this case, obviously, scrap metal volumes at MRT would cease to exist.

The projected market shares are based on the preceding market analyses as well as consideration of various scenarios presented in *Table 2.16*. The projected market share growth rates are shown in *Table 2.17*.

These market share CAGRs were applied to a starting year market share over a twenty year period and then multiplied by the market volumes for each commodity at PMSL to determine the volume at MRT.

It should be noted that these key commodities do not represent all potential cargoes to be handled at the MRT. They do make up the bulk of the volume but not the total volume. There are other commodities brought to the terminal in a given year. In the future these could include magnetite and ferro manganese, DDGs, project cargo, and "green" manufacturing, which are discussed in the Commodities Analysis section.

A review of the historical data showed that this additional tonnage accounted for 17 percent of the total volume of the key commodities, on average. Therefore 17 percent was added to the forecast to reflect the potential for other commodities to enter the terminal, which is realistic in that some of MRT's cargo activities have been served on an ad hoc basis. Given the existence of this ad hoc cargo, the terminal will need to be designed in such a way as to accommodate a variety of common cargo types.

Presenting the Forecast

Table 2.18 on the following page shows MRT's volume in 2009, followed by the forecast of MRT's volume in 2030 in each of the three cases- low, base and high- for each of the key commodities. These volumes are in terms of one-way outbound traffic only.

The forecast shows significantly different outcomes in each MRT projection case:

- *Low Case:* The total projected volume in 2030 is 654,650 tons, which is roughly 20,000 tons more than the terminal's total volume in 2009. An increase in salt volume is offset by a decrease in scrap volumes over the 20 year forecast period.
- *Base Case:* The total projected volume in 2030 is slightly more than 1 million tons, which is 1.6 times greater than the volume in 2009. Coal volume nearly doubles while salt also experiences strong growth and the terminal transports sizeable volume of grain and oilseeds. Scrap volume remains roughly the same as in 2009.
- *High Case:* The total projected volume in 2030 is more than 1.6 million tons, which is nearly 1 million tons more than it transported in 2009. The greatest increase in tonnage is in salt, though scrap and coal also experience strong growth. Grain and oilseeds are transported in significant volume as well.

Commodity	Low Case Market Share CAGR	Base Case Market Share CAGR	High Case Market Share CAGR
Coal	0.0%	1.0%	2.0%
Iron & Steel Scrap	-1.0%	0.0%	1.0%
Salt	-1.0%	0.0%	1.0%
Fish Meal / Nitrogenous Fertilizer	0.0%	1.0%	2.0%
Grain	N/A	1.0%	2.0%
Oilseeds	N/A	1.0%	2.0%

Table 2.17 - Forecast MRT Market Share CACRs (2011 to 2030)
Source:Halcrow

Commodity	MRT Volume in 2009	MRT Volume in 2030 - Low Case	MRT Volume in 2030 - Base Case	MRT Volume in 2030 - High Case
Coal	43,836	61,500	83,328	112,623
Iron & Steel Scrap	233,777	174,045	236,166	354,405
Salt	243,213	297,710	404,182	547,351
Fish Meal / Nitrogenous Fertilizer	19,573	12,287	16,648	22,500
Grain	0	0	74,297	151,864
Oilseeds	0	0	53,599	158,979
*Other Commodities**	92,816	109,108	173,644	269,545
TOTAL	633,215	654,650	1,041,864	1,617,267

Table 2.18 - MRT Volume Forecast (Tons)
*Source: Halcrow, * May include magnetite, ferro manganese, DDGs, project cargo, and green manufacturing*

LOW CASE - VOLUME IN 2030						
COMMODITY	Inbound			Outbound		
	Barged	Railed	Trucked	Barged	Railed	Trucked
Coal	53,875	0	7,625	5,224	0	56,276
Fish Meal	12,287	0	0	0	0	12,287
Salt	285,302	3,501	6,636	4,678	0	238,535
B-Scrap / Scrap / Shredded Scrap	7,253	128	166,664	163,139	2,159	8,746
Other Commodities	68,308	832	39,969	35,289	4,064	69,756
TOTAL	427,024	4,460	220,894	208,329	6,223	385,600

Table 2.19 - MRT Volume Forecast by Mode-Low Case
Source:Halcrow

BASE CASE - VOLUME IN 2030						
COMMODITY	Inbound			Outbound		
	Barged	Railed	Trucked	Barged	Railed	Trucked
Coal	72,997	0	10,331	7,078	0	76,250
Fish Meal	16,648	0	0	0	0	16,648
Salt	387,336	5,818	11,028	7,773	0	396,408
B-Scrap / Scrap / Shredded Scrap	9,842	173	226,151	221,368	2,930	11,868
Grain	0	0	74,297	74,297	0	0
Oilseeds	0	0	53,599	53,599	0	0
Other Commodities	108,710	1,323	63,610	56,161	6,468	111,015
TOTAL	595,532	7,314	439,017	420,278	9,398	612,189

Table 2.20 - MRT Volume Forecast by Mode-Base Case
Source:Halcrow

The MRT volume forecast is presented in *Table 2.18*. The forecast by mode is detailed in *Tables 2.19* and *2.20*. The distribution assumes that the breakdown by mode would be the same over the forecast period as it has been historically from 2000 to 2010.

Analysis of the Forecast

Table 2.21 presents MRT's projected market share of PMSL volume in specific commodities in the year 2030. In the base case, MRT is able to maintain its current share of the scrap and salt market, which is quite high; it also gains a foothold in the grain and oilseeds markets, two markets where it had 0 percent of PMSL share in 2009.

The difference between the market share in the base case and other cases for some commodities may appear minor, but can amount to tens of thousands of tons when considering the overall size of the market. For example, the difference between 0.5 percent and 0.7 percent share of the coal market is approximately 61,000 tons.

In the low case, MRT is projected to lose 9 percent of its current market share of iron and steel scrap at PMSL, which amounts to nearly 60,000 tons per year, in 20 years; in the high case, it gains 11 percent share in 20 years, which results 61 percent share of PMSL's iron and scrap steel in 2030.

Likewise, in the low case, MRT is projected to lose 10 percent of its current market share of salt at PMSL, which amounts to over 100,000 tons per year, in 20 years; in the high case, it gains over 12 percent share in 20 years, which results in 67 percent share of PMSL's salt market in 2030.

Table 2.22 on the following page presents each commodity's share of MRT's volumes in 2009 and in 2030. The analysis shows that salt is projected to account for the greatest share, followed by iron and steel scrap.

The share of scrap drops significantly from the 2009 share in all three cases. All other commodities either maintain or grow their 2009 share of MRT volume, which suggests that scrap volume is not projected to grow as fast as the volume of other commodities.

Grain and oilseeds are projected to account for a significant percentage of MRT's volume in the base and high case, combining for nearly one-fifth of the terminal's volume in the high case. The fact that no grain or oilseeds are predicted under the low case emphasizes the need for the MRT operator to market the facility accordingly.

Fish meal is not as much of a factor, declining slightly from its 2009 share of 3 percent to 2 percent in the low and base case and only 1 percent in the high case.

Coal's share remains roughly where it was in 2009, though it is interesting to note that its share of MRT's volume is greater in the low case (9 percent) than it is in the high case (7 percent).

HIGH CASE - VOLUME IN 2030						
COMMODITY	Inbound			Outbound		
	Barged	Railed	Trucked	Barged	Railed	Trucked
Coal	98,660	0	13,963	9,566	0	103,057
Fish Meal	22,500	0	0	0	0	22,500
Salt	524,538	7,879	14,934	10,527	0	536,824
B-Scrap / Scrap / Shredded Scrap	14,769	260	339,376	332,199	4,397	17,810
Grain	0	0	151,864	151,864	0	0
Oilseeds	0	0	158,979	158,979	0	0
Other Commodities	168,749	2,054	98,741	87,178	10,040	172,327
TOTAL	829,217	10,193	777,858	750,313	14,436	852,518

Table 2.21 - MRT Volume Forecast by Mode-High Case
Source: Halcrow

Commodity	MRT Market Share of PMSL, 2009	MRT Market Share of PMSL, 2030 - Low Case	MRT Market Share of PMSL, 2030 - Base Case	MRT Market Share of PMSL, 2030 - High Case
Coal	0.5%	0.5%	0.6%	0.7%
Iron & Steel Scrap	50%	40.9%	50.0%	61.0%
Salt	55%	45.0%	55.0%	67.1%
Fish Meal / Nitrogenous Fertilizer	2.6%	2.6%	3.2%	3.9%
Grain	0%	0.0%	1.5%	2.4%
Oilseeds	0%	0.0%	4.5%	11.9%

Table 2.22 - MRT Volume Forecast as a percent of PMSL Volume
Source:Halcrow

Commodity	Share of MRT Volume, 2009	Share of MRT Volume, 2030 – Low Case	Share of MRT Volume, 2030 – Base Case	Share of MRT Volume, 2030 – High Case
Coal	7%	9%	8%	7%
Iron & Steel Scrap	37%	27%	23%	22%
Salt	38%	45%	39%	34%
Fish Meal / Nitrogenous Fertilizer	3%	2%	2%	1%
Grain	0%	0%	7%	9%
Oilseeds	0%	0%	5%	10%
Other Commodities	15%	17%	17%	17%

Table 2.23 - Commodities at MRT as a percent of Its Forecasted Volume
Source: Halcrow

Summary

MRT has an opportunity to increase throughput volume, and, consequently, increase revenues over the next twenty years by focusing specifically on commodities that best fit with its geographic location and operational profile.

After a thorough analysis of the highest volume commodities at the national level as well as at PMSL and MRT, Halcrow has identified the following commodities as having the most potential for MRT:

1. Salt
2. Iron and Steel Scrap
3. Coal
4. Grain
5. Oilseeds
6. Fish Meal/Fertilizer

Certain commodities that are currently handled at MRT, including petroleum coke, cement, sand and asphalt, were determined, in the course of the market analysis, to have limited growth potential. The terminal has limited capacity and the forecast is designed to accommodate those commodities that are most suited and most likely to be handled at the MRT in the future.

Grain and oilseeds have not historically been handled at MRT in high volumes. Therefore considerable efforts will need to be expended on the part of the owner and/or operator to make inroads into these markets, both on the marketing/business development side (to establish relationships with major suppliers and purchasers of the commodities) as well as on the terminal development and operations side (to make sure the required facilities and equipment are in place to handle them).

Salt, scrap and coal are currently being handled at MRT, and the analysis shows that they should continue to be a major focus of the terminal's growth.

A proportion of MRT's cargo has, to date, been brought in on an ad hoc basis, and this is likely to continue in the future. Additionally, new cargo types such as DDGs and "green" manufacturing may constitute a greater percentage of the terminal's volumes in the future, while specialized equipment and materials (project cargo) may also be accommodated on an ad hoc basis. Therefore, a contingency factor was built into the forecast to account for these additional volumes.

Over the past 10 years, the cargo transportation industry has been impacted by changes in supply chain management, economic conditions, consumer demand, government regulation, local industries, and various other factors. Although MRT had limited power to change or control any of these factors, it experienced growth and decline in its own volumes as a result of the changes to them. The lesson to be learned from the past decade is that greater flexibility is the best approach for any terminal to meet long term market opportunities.

This flexibility should come both in the form of the commodities being handled at the terminal, as well as the way they are handled. Indeed, MRT's ability to balance tonnage by mode will be very important over the long term because diversification is a proven strategy for hedging risk in the event that one or more commodities are not transported in the foreseen volumes.

MRT has historically relied upon truck and barge for the transportation of commodities. Transporting more cargo by rail would be a wise strategy to diversify the terminal's modal profile. If MRT can identify a market that would allow for the transfer of one of the above commodities by rail, perhaps grain, it would hedge risk and maximize the use of its inter-modal capabilities.

5. LAND USE AND INFRASTRUCTURE ANALYSIS

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5. Land Use and Infrastructure Analysis

Land Use Analysis

The primary purpose of zoning and land use controls is to segregate incompatible uses to protect safety, health and welfare. Even within primarily industrial areas, land use controls are necessary to ensure compatibility for a variety of businesses and industries with different needs. In addition to compatibility, land use regulations evolved to address other considerations including but not limited to potential environmental impacts and adequate infrastructure provisions. Unfortunately, like many other older parts of the City, development within the NRCC predated these land use controls.

Existing Zoning

As shown in *Figure 5.1*, approximately 88 percent of the NRCC is zoned as "K" Unrestricted District. This district allows any use not in conflict with City nuisance regulations. Outdoor storage, salvage and junk yard operations and scrap metal processors are allowed under this district as a conditional use. These unregulated uses, are incompatible with existing and potential future business uses. The next largest zoning district in the NRCC is the "J" Industrial District which comprises approximately eight percent of the NRCC. A majority of these properties front along North Broadway Street in the south half of the NRCC. The "J" Industrial District allows a wide-range of non-noxious land uses. The "F" Neighborhood Commercial and "G" Local Commercial and Office District properties comprise approximately two percent of the NRCC and are located sporadically along North Broadway Street and in the northwest edge of the NRCC. The "A" Single-Family Dwelling District, "B" Two-Family Dwelling and the "E" Multi-Family Dwelling District properties comprise approximately two percent of the area and are also located in the northwest edge of the NRCC west of Hall Street.

The *2003 North Riverfront Business Corridor Plan* raised significant concerns about the number of conditional uses allowed in the Unrestricted District, especially salvage and junk yard operations. The plan's recommendations proposed to rezone portions of the NRCC to more compatible uses with emerging businesses and identified proposed future uses. A significant issue with the present Zoning Code is that is does not have design standards for a high-quality mix of uses appropriate within the NRCC.

SPECIAL USE DISTRICT

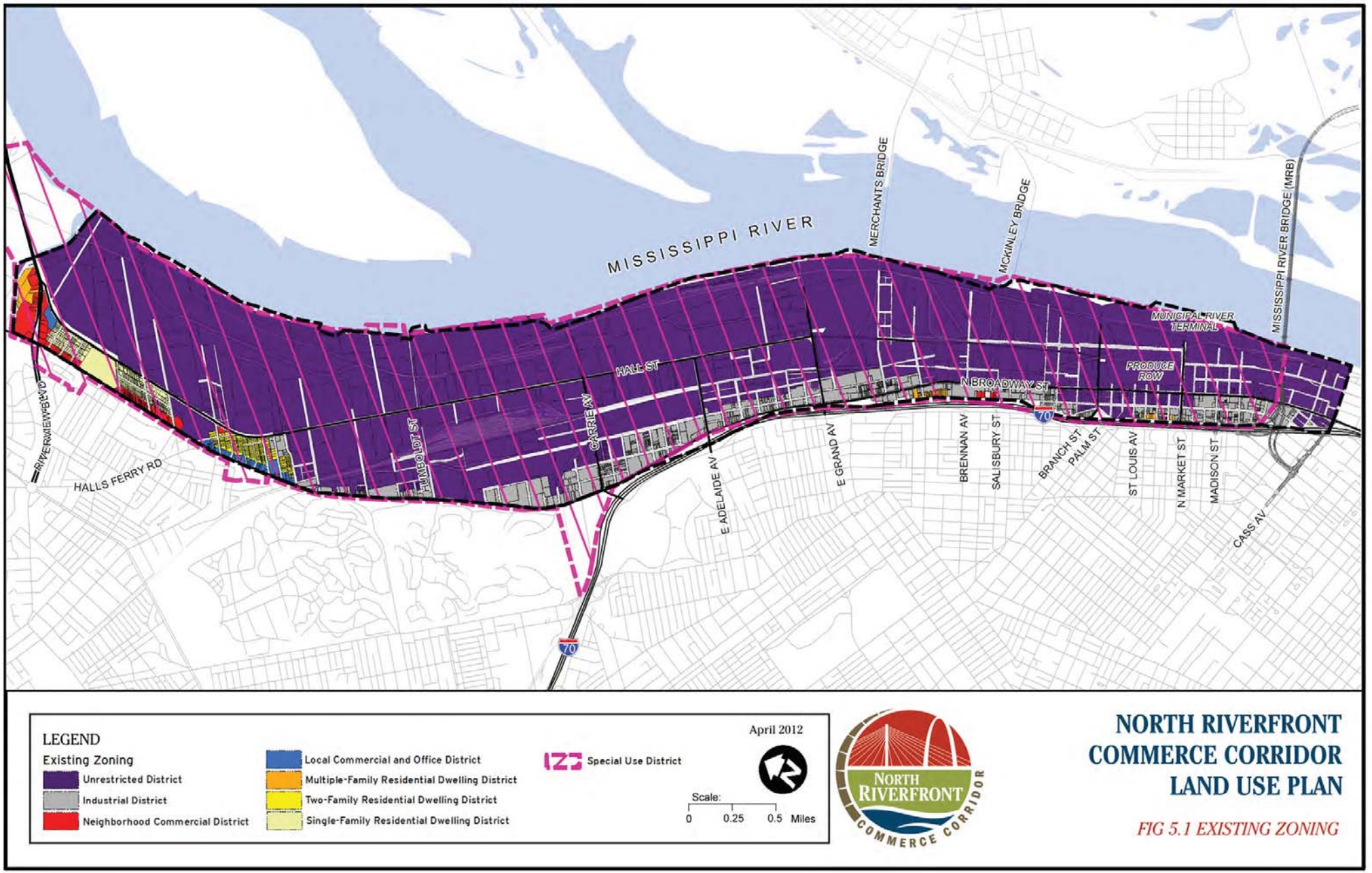
On February 9, 2007 the *North Broadway Vicinity Commercial Areas Special Use District* was adopted to address compatibility issues with salvage and junk yard operations, major scrap metal processors and vehicular-related businesses allowed as a conditional use within the "K" Unrestricted District.

Major restrictions within this District include (See *Ordinance 67390* for complete list of restrictions):

- Existing Salvage and Junk Yard Operations, Major Scrap Metal Processors and Vehicular-Related Businesses within the District with a valid occupancy permit and a valid business license from the City of St. Louis shall be considered legal and conforming uses.
- New or expanded Salvage and Junk Yard Operations, Major Scrap Metal Processors and Vehicular-Related Businesses are not permitted and are considered non-conforming uses.
- Non-conforming Scrap Metal Operations and Vehicular-Related Businesses must be discontinued within thirty days (ninety days for non-conforming Scrap Metal Processing Operations) from the date upon which the City issues notice of the non-conforming use.
- If an owner or operator of an existing Salvage Junk Yard Operation or Vehicular-Related Business within the District discontinues its operations for more than thirty days (ninety days for a Major Scrap Metal Processor), such Operation shall automatically become a discontinued non-conforming use.
- If a new owner or operator of an existing Salvage and Junk Yard Operation, Major Scrap Metal Processor or Vehicular-Related Businesses in the District applies for an occupancy permit more than thirty days after the transfer of ownership, the occupancy permit will be denied.

Major standards within this District include (*See Ordinance 67390* for complete list of standards):

- Salvage and Junk Yard Operations are permitted to operate only after 7:00 am and before 6:00 pm on Mondays through Fridays, after 8:00 am and before 4:00 pm. on Saturdays, and shall not be permitted to operate on Sundays.
- Salvage and Junk Yard Operations must be secured on all boundaries by an approved fence or wall to prevent unauthorized entry and to screen operations from adjacent properties. Major Scrap Processors are required to conform to the fence and wall barrier requirements of *Chapter 8.50* of the *Revised Code* of the City of St. Louis.
- Salvage and Junk Yard Operators must make a photocopy of a customer's valid driver's license prior to accepting or making a payment for any article of property.



NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG 5.1 EXISTING ZONING

- Salvage and Junk Yard Operators are prohibited from purchasing certain metals (copper, brass, copper alloy, nickel, nickel alloy, iron, steel, tin, mercury, lead) for cash.
- All vehicle repairs must occur within a building. Open storage of damaged vehicles waiting for repair is limited to two weeks. Salvage and junkyard operations are prohibited.

PERMITTING PROCESS

According to stakeholders meetings comprised of NRCC business and property owners, the City's permitting and regulatory process is perceived as more stringent and difficult to navigate than other jurisdictions in the metropolitan area. The belief that City's regulatory process is more onerous than other jurisdictions may be more of a perception than reality, however, it is difficult to quantify these experiences due to the diversity of projects in the NRCC and the difference between developing on greenfield sites and greyfield and brownfield sites with older building stock. Due to the age and condition of existing buildings in the NRCC, redevelopment and rehabilitation projects are expensive to bring up to City safety and health codes, fire codes and ADA accessibility requirements.

Land Suitability Analysis

The land suitability analysis utilizes a Geographic Information Systems (GIS) as a tool for evaluating the relative developability of land for future development or redevelopment based on a number of factors including analysis of existing businesses, age of the property, recent investments, ease of land assembly and environmental data. Some areas are more difficult or costly to develop or redevelop than others based on these factors. GIS data were provided by the City of St. Louis, St. Louis County and East-West Gateway.

DEVELOPMENT ANALYSIS

The analysis does not provide site-specific results, nor does it make land use recommendations for individual properties. The intention of the Development Categories is to provide a big-picture framework that will allow the Study Team to target specific implementation strategies based on similar characteristics.

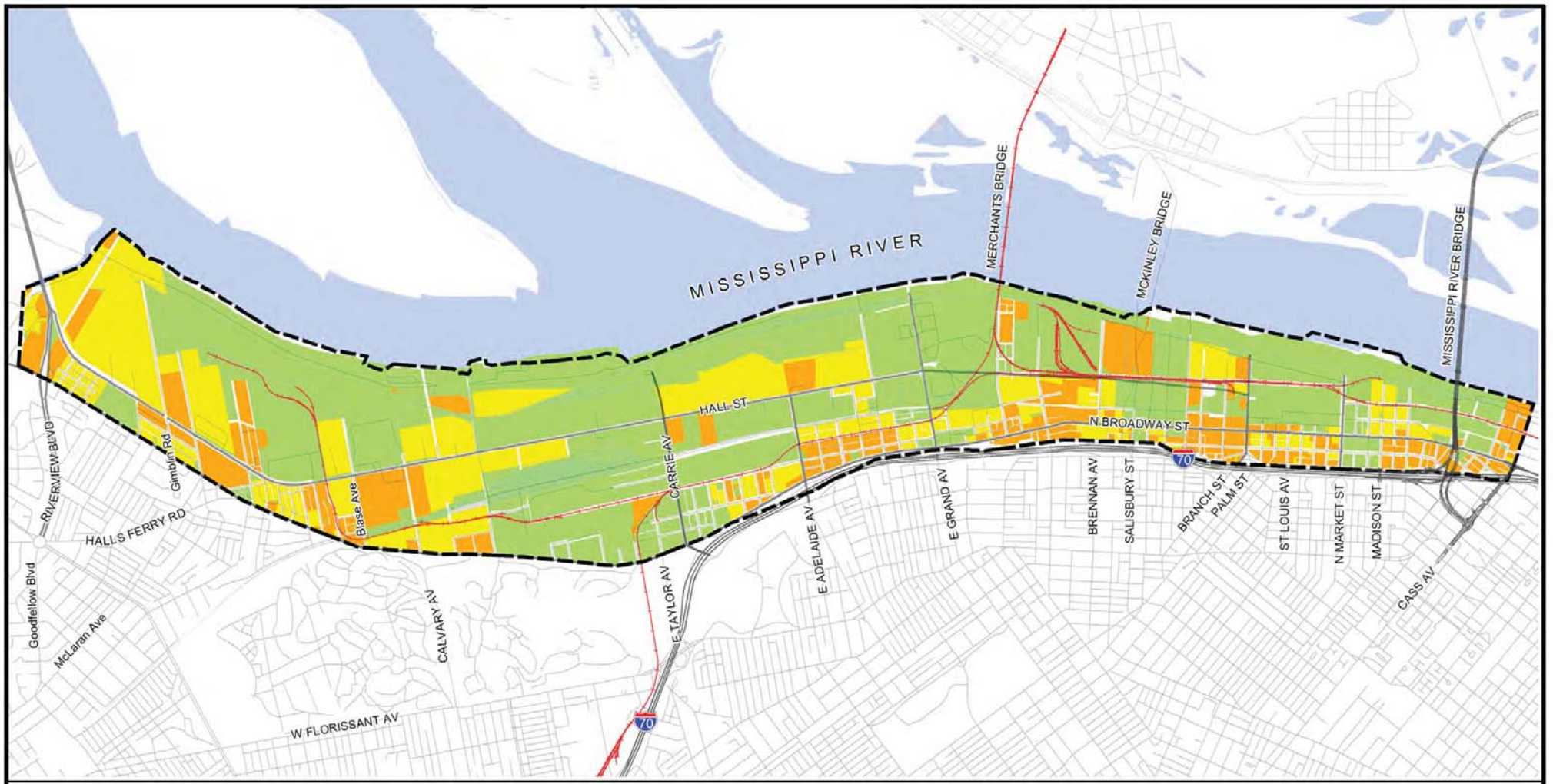
The following Development Categories are delineated on *Figure 5.2* Land Development Analysis and described below:

- **Stable Areas** have the following characteristics:
  - Long-term anchor businesses. Examples of anchor businesses include, but are not limited to SLDC properties including the MRT, St. Louis Produce Market , MSD, railroad properties, Covidien, Green Street Properties, P&G, Dial Corporation and Affton Properties.
  - For non-anchor businesses, parcel size greater than 20 acres. These parcels account for less than one percent of the NRCC parcels and approximately 20 percent of the total land area. This parcel size is a minimum need for any large-scale business.
  - Newer building stock less than 50 years old or older building stock with recent investments. Recent investments are documented by active building permits and demolitions, etc. Buildings built after 1961 comprise approximately 19 percent of all NRCC buildings.
  - No significant known or documented environmental issues.

- **Transitional Areas** have the following characteristics:
  - Wide range of active medium-sized industrial and commercial businesses. These include active nonconforming business uses identified within the Special Use District.
  - Ownership tracks between 10 to 20 acres. These parcels account for slightly less than two percent of the total study area parcels and 19 percent of the total land area. This parcel size can be used for a wide-range of small to-medium sized businesses, however, these sites are too small for significant distribution facilities. Approximately 25 percent of the NRCC's land is comprised of parcels between 10 to 20 acres.
  - Aging building stock 50 to 100 years old. Buildings built between 1911 and 1961 comprise approximately 50 percent of NRCC buildings.
  - Slight or potential environmental issues. For the purposes of this Study, slight environmental issues are defined as properties categorized as "closed" brownfield sites by the U.S. Environmental Protection Agency (EPA). In most cases, these properties have been cleaned up, however, monitoring and in some cases, and ongoing mitigation and/or maintenance is required.

- **Redevelopment Areas** have the following characteristics:
  - Identified vacant properties and/or scattered and fractured ownership patterns.
  - Parcels less than 10 acres. These parcels account for a little more than 97 percent of the total NRCC parcels and approximately 61 percent of the total land area. This parcel size is difficult to develop for most industrial or significant commercial business operations.
  - Older building more than 100 years old without recent known documented improvements. Buildings built before 1911 comprise approximately 31 percent of NRCC buildings.
  - Significant environmental issues. For the purposes of this Study, significant environmental issues are defined as properties categorized as "active" brownfield sites by the EPA.

These Land Development Categories will be used as a planning framework for the development of the Final NRCC Land Use Plan and associated recommendations.



LEGEND

Land Development Analysis

- Stable and Planned Areas
- Transitional Areas
- Redevelopment Areas
- Study Area
- TRRA Rail Lines

Size of Typical Development Sites

- 5-ac / 10-ac — Small Non-Industrial Business Sites (5-acres to 10-Acres)
- Small-Scale Distribution Sites (10-acres to 40-acres)
- 40-ac — Medium-Scale Distribution Sites (40-acres or Greater)

April 2012

Scale: 0 0.25 0.5 Miles

NORTH RIVERFRONT COMMERCE CORRIDOR

NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG 5.2 LAND DEVELOPMENT ANALYSIS

LAND ASSEMBLY

A major issue limiting future development and redevelopment opportunities within the NRCC is scattered and fractured land ownership patterns. Existing local rail lines can be a locational benefit; however, many properties are bisected by these lines limiting full use of disjointed parcels. Within other areas, small parcels with numerous owners significantly increase development costs. The NRCC has to complete with suburban "shovel ready" sites on large parcels with one owner. Land assembly involves joining contiguous lots to make one larger parcel of developable land. Contiguous parcels in an urban area are often too small to build anything more than one house. Putting land together one piece at a time can be very expensive for a developer, especially if there are significant environmental and infrastructure issues. As a result, redevelopment within the NRCC tends to occur within or on the fringe of "Stable" areas where there are large tracks of land to meet the needs of emerging businesses and industries.

LAND ASSEMBLY STRATEGIES

- *Understand the Needs of Existing and Emerging Businesses:* The plan process integrates a significant Stakeholder process that includes major land owners and businesses. To follow on to the process, the Study Team is actively engaging real estate professionals and lenders for the Market Analysis to determine the needs of emerging industries and businesses that may be interested in the NRCC.
- *Create a Redevelopment Plan:* The redevelopment plan should identify strategic priority areas for development based on the analysis and stakeholder engagement throughout the plan process. This plan will provide the SLDC and the City guidance for incentives and plan approvals for future development.
- *Joint Ventures with Private Partners:* The City and SLDC may engage various landowners to sign a contract agreeing to pool their land. Joint venture or limited partnerships, land trusts, or community cooperatives or corporations provide ways to structure these private land assembly agreements. Green Street Properties is actively acquiring multiple sites within the NRCC for redevelopment. According to Green Street representatives, companies are interested in locating to the NRCC, however, there is a perception of lack of developable sites to meet the needs of existing and future users. One idea generated during the stakeholder interviews is to actively engage major businesses and property owners in a forum to share information about the NRCC. The next step could be to set up joint ventures to pool resources for land assembly.
- *Form a Land Bank:* The intention of the land bank is to actively purchase strategic properties for future land assembly and development. Other potential applications can be the purchase of underutilized properties for environmental or recreational benefits. This can include applications for natural LID stormwater management applications and/or amenities or connections to the Great Rivers Greenway and Trailnet projects.

Two public agencies currently acquire land in the NRCC for future development:

- *The Land Reutilization Authority (LRA)* receives title to all tax delinquent properties not sold at the Sheriff's sale. It also receives title to properties through donations. The SLDC Real Estate Department maintains, markets, and sells these properties and performs land assemblage for future development. The LRA currently owns 105 parcels with NRCC accounting for approximately 23 acres. The mean parcel size owned by the LRA is 0.22 acres.
- *The Land Clearance for Redevelopment Authority of the County of St. Louis (LCRA)*, a County authority, has the ability to acquire property and prepare it for redevelopment within blighted areas. The LCRA currently owns three small parcels in the NRCC.

Environmental Analysis

The NRCC was historically used for a wide variety of moderate to heavy commercial and industrial uses including (but not limited to) manufacturing, chemical storage, junkyards, gas stations, and trucking terminals. Many of these uses predate the regulatory programs designed to minimize their negative environmental impact. An additional complicating factor includes fill material used to raise development sites above the flood zone, which often contains ash, cinders, and other non-native materials that are commonly impacted with heavy metals (such as lead and arsenic), polychlorinated biphenyls (PCBs) and an array of polynuclear aromatic hydrocarbons (products of incomplete combustion) including benzo (a) pyrene. The cleanup costs associated with such sites can be a significant impediment to redevelopment. In some instances, property owners and prospective investors may not be aware of these issues.

BROWNFIELD ASSESSMENT AND CLEANUP

The St. Louis Brownfields Program finds resources to assess, clean, and find productive uses for abandoned and underutilized sites where environmental contamination is perceived to be a major impediment to reuse. SLDC administers this program and routinely seeks financial and in-kind assistance from its partners at the US Environmental Protection Agency (EPA) and the Missouri Department of Natural Resources (MDNR).

The NRCC was selected by SLDC as an area in which its Brownfield redevelopment resources could be concentrated, in an effort to reveal and plan for the correction of environmental impediments. Between 2000 and the present, SLDC has managed more than $5 million in these resources throughout the city, and notable accomplishments within the NRCC are included on the following page.

Notable Projects within the NRCC:

- *Corridor Master Plan and Area-wide Site Characterization*
- *2226 N. 1st: Assessments and tank removal to support reuse by Steel Warehouse*
- *7850 North Broadway: Assessments and cleanup of Baden Apartments Site*
- *121 Dock Street: Assessments and cleanup of PCB-impacted soil*
- *50 E. Grand: Assessments in support of North Incinerator site redevelopment*
- *200 Penrose: Assessments and cleanup of abandoned trucking terminal/junkyard*
- *2108 N. 9th Street: Assessments to support expansion of Wunderlich Fibre Box Company*
- *3930 N. 9th: Assessments to support expansion of Middendorf Meats*
- *134 Branch Street: Assessments to support St. Louis Produce Market expansion*
- *5908 N. Broadway: Assessments and cleanup of former Norman Corporation Site*

SLDC continues to focus on redevelopment opportunities, with a particular concentration on land assembly and cleanup to support creation of the Adelaide Business campus, southeast of East Carrie and North Broadway Street.

SOILS

The NRCC was formerly a marshy area that was subject to frequent flooding from the Mississippi River. As a result, a significant volume of fill material, up to five feet in depth in some places, was placed throughout the area. In addition, much of the NRCC is now protected from flooding by a levee. In spite of these improvements, periodic flooding can still occur in heavy rain events due to overwhelmed storm sewers, high water table and low permeability soils. In addition to the environmental challenges posed by fill discussed in the previous section, property owners within the NRCC have higher foundation engineering costs when compared to other industrial and business parks throughout the metropolitan area. Care should be taken to ensure that structural soil conditions are properly evaluated when considering new developments in the NRCC.

FLOODPLAIN

In recognition of the risks and problems in floodplain areas, development should be carefully controlled and restricted. There are four aspects of floodplain areas to be considered when planning and administering floodplain area development controls and restrictions. *Figure 5.3* delineates identified areas within an identified 100-year of 500-year floodplain within the NRCC. These floodplain designations are defined below:

- *100-Year Floodplain:* the part of the drainage basin which is within the one-percent annual chance floodplain but which is not within a floodway. This area is also referred to as a Special Flood Hazard Area (SFHA). Development in the 100 year floodplain may be appropriate if adequate measures are taken to protect the development from the flood hazards, including but not limited to raising the proposed structure at least 1-foot above the base flood elevation.
- *500-Year Floodplain:* the part of the drainage basin which is within the 0.2 percent annual chance floodplain. Development in the 500 year floodplain may be appropriate if adequate measures are taken to protect the development from the flood hazards.

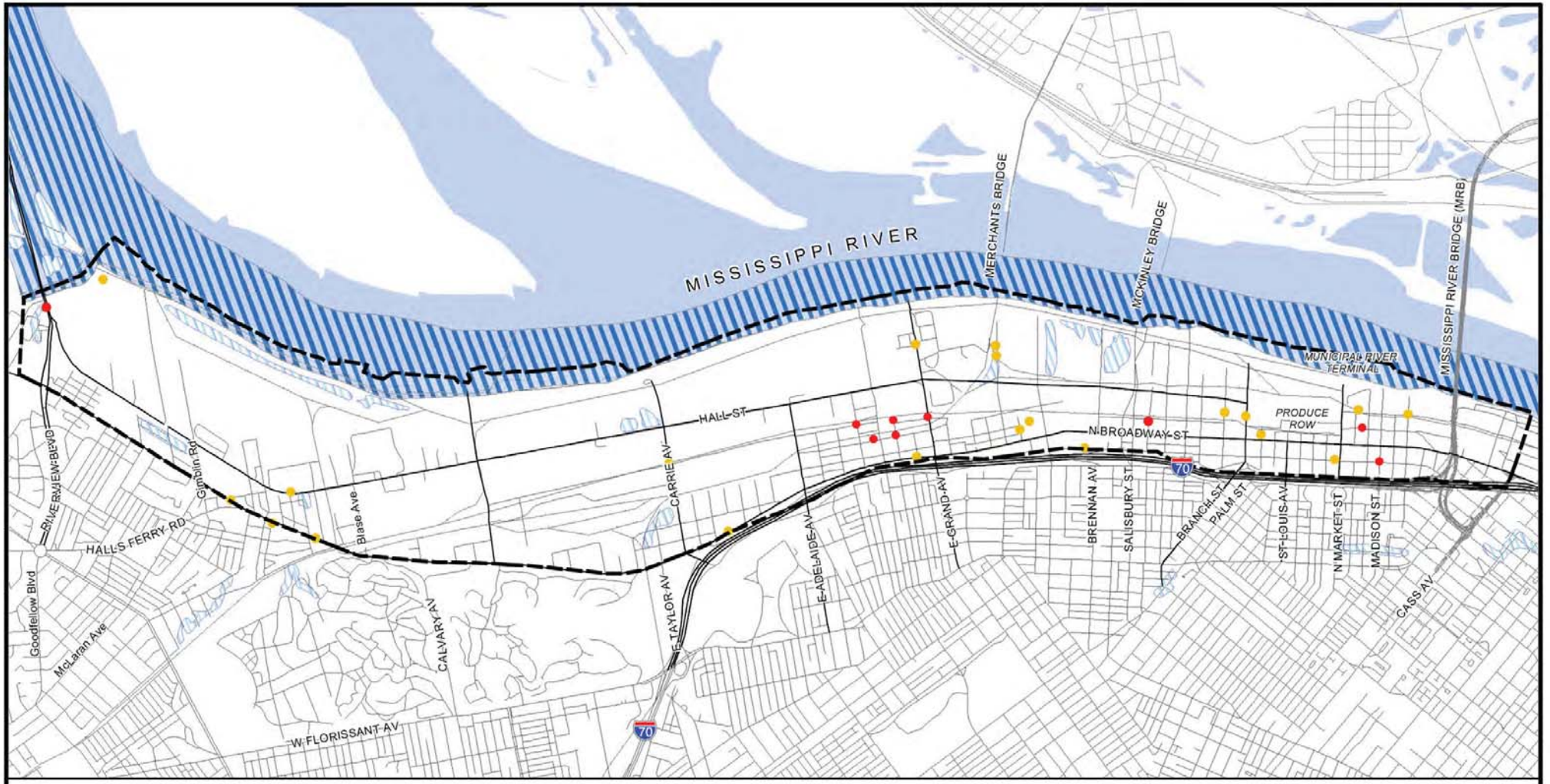
A majority of the NRCC outside the 100-Year Floodplain is protected by a levee. Currently, there are two access gates at Branch Street and North Market Street. Flood certification by the U.S. Corps of Engineers (USCE) is likely to finish in 2013/14.

AIR QUALITY

The Clean Air Act requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The primary pollutants of concern for St. Louis are ozone and particulate matter. Particulate matter is a mix of solid particles and liquid droplets suspended in the air. Fine Particulate matter is considered to be less than or equal to 2.5 microns in diameter (about 1/30 the width of a human hair). Fine Particulate matter is made up of a variety of components including acids, organic chemicals, metals, dirt, or dust particles. Fine particulate matter can be emitted directly from the combustion of fuel (power plants, motor vehicles, wood burning), fires and certain industrial activities. Other particles may be formed indirectly from the chemical change of gases, such as sulfur dioxide , nitrogen oxides and volatile organic compounds, in the air. Fine particulate matter can also be formed individually when these gases react with sunlight and water vapor. Particulate matter can affect human health and is a source of haze which reduces visibility.

The St. Louis area was recently designated an attainment area under the 2006 24-hour PM2.5 standard due to “clean” air quality monitoring data for 2007-09, but is still non-attainment for the annual PM2.5 standard. Based on 2007-2009 monitoring data, the area has met the 1997 eight-hour ozone standard (80 parts per billion or ppb) demonstrating ongoing progress. Both Missouri and Illinois are developing Maintenance Plans to show that the area has attained this standard. Once the components of the maintenance plans are in place, the region and the MDNR intend to request that the EPA redesignate the St. Louis region as attainment.

The City has an Air Pollution Control ordinance (Ordinance 65645) to address potential air quality issues (such as dust control) associated with new development. Additionally, components of the Special Use District are intended to control dust and emissions from certain businesses and industries by regulating the containment and opera-



LEGEND

Study Area

Floodplain

100 Year Floodplain

500-Year Floodplain

*USEPA Regulated Facilities or Cleanups

Brownfield Sites

Hazardous Waste Large Quantity Generators

*Data from USEPA ACRES Database.

April 2012

Scale: 0 0.25 0.5 Miles

NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG 5.3 ENVIRONMENTAL FRAMEWORK

tions that may negatively affect neighboring properties. However, despite these efforts, according to stakeholders, dust and emissions from a number of non-conforming uses within the NRCC continue to be an issue.

Utility Analysis

The availability of adequate infrastructure is critical to the NRCC reaching its full development potential. The availability and cost of public infrastructure is a key component to attract and retain businesses and industries in the area. The following analysis includes information gathered from City staff, service providers, stakeholders and site visits. This analysis will identify critical areas of concern within the NRCC that will need to be addressed in advance of new development and redevelopment.

Major utilities in the NRCC include telephone service provided by AT&T, gas service provided by Laclede Gas Company, electric service provided by Ameren Missouri, domestic water service provided by the St. Louis Water Division and wastewater and stormwater service provided by the St. Louis Metropolitan Sewer District (MSD). St.-Louis Trigen Energy (Trigen) provides steam heat downtown businesses, however, there are currently no plans to expand within the NRCC. The location and types of utilities are illustrated in *Figure 5.4 Sewer Line Types, 5.5 Major Sewer Line Sizes, 5.6 Gas Service Line Sizes and 5.7 Overhead Electric Service Lines*.

The existing utilities within the NRCC can handle, with the exception of a few, moderate future developments without extensive capital investment on the part of the utility companies. Their current facilities are either adequate or will need minimal investment to bring any property or combination of properties to a functional state to meet the need of the expected residential, commercial or industrial entities. Each utility will require certain criteria be met before approving any infrastructure development.

ELECTRIC SERVICE

A majority of NRCC utilities are located underground with the exception of overhead electric lines that traverse the NRCC. The overhead electric lines can provide an impediment for new development or redevelopment of certain parcels and contribute to the visual clutter throughout the area.

In 2004-2005, Ameren initiated discussions with the City about future development in struggling areas. The result of these discussions was a *2007 Economic Redevelopment Rider* to assist with distressed areas. This rider had a geographic focus based on user needs. If an eligible business is expanding and is limited by physical limitations, there are incentives for with relocating distribution facilities. The cost of the relocation may be offset in part by an amount not to exceed 50 percent of the net annual revenue estimated from the new development. Eligible customers may also receive a 15 percent discount for up to five years. Future land assembly and redevelopment will need to plan in advance for north-south electric lines. Due to the disconnected north-south street network, there are few north-south lines within the NRCC.

Planned Improvements: According to Ameren, the only major improvement to electric service planned in the NRCC is a substation for Dial Corporation. No other substations are planned; however, the type and intensity of future development will determine future power needs. Major commercial or industrial development would likely require the construction of substations.

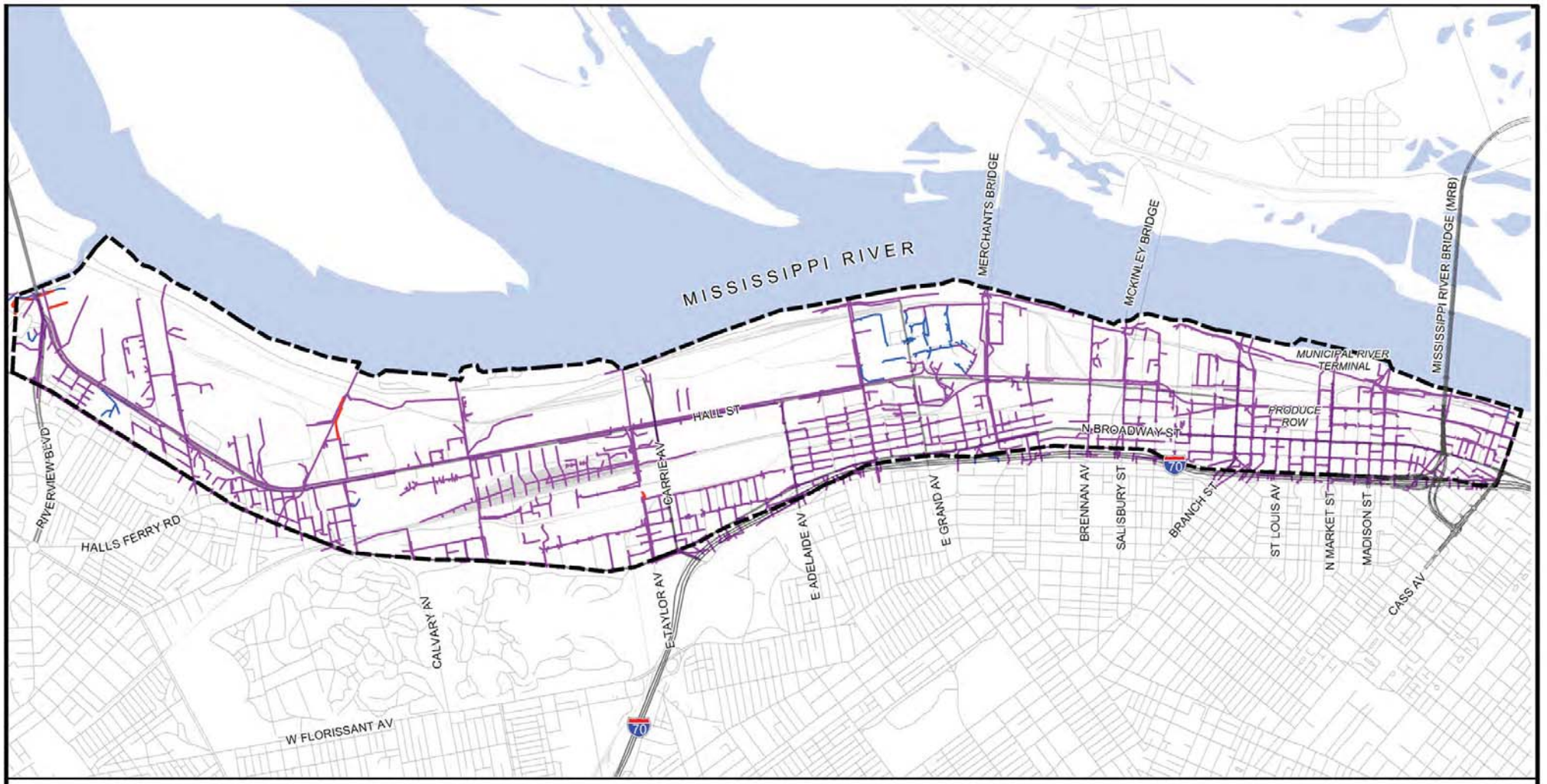
DOMESTIC WATER

Domestic water lines are located under City streets throughout the NRCC. According to City staff, there is sufficient water capacity and pressure to handle existing development. As with other older parts of the City, repair and maintenance of existing water lines is necessary. Future development and redevelopment scenarios should be analyzed to ensure that water capacity and pressure meet future demand.

Planned Improvements: No expansion projects are planned at this time. The City of St. Louis Water Department has an on-going program to replace aging facilities.

WASTEWATER AND STORMWATER

MSD, created in 1954 by the voters of St. Louis City and County, began operation in 1956 by taking over the various publicly owned wastewater and stormwater drainage facilities within its jurisdictions. There is a maze of storm and sanitary sewer lines within the NRCC ranging from 12 inches to 9 feet (108 inches) in diameter conveying systems of different pipe types and installed at different periods over the years. With few exceptions, the customers within the area are served by a combined sewer system. The area is largely served by an 84-inch circular tunnel from the north which connects to the Bissell Point Wastewater Treatment Plant (WWTP). The Maline Creek combined sewer flows south along Hall Street via a 72-inch circular tunnel changing into a 78-inch circular tunnel and becoming an 84-inch circular tunnel before entering the Bissell Point WWTP. Storm and sanitary combined sewers in the NRCC south of the Bissell point WWTP is conveyed through a 90-inch circular tunnel and changing into a 102-inch circular tunnel before entering the plant. See *Figure 5.5* for the various pipe sizes in the area. The Bissell Point WWTP is the largest wastewater treatment facility in Missouri and it is located in the NRCC. The Bissell Point watershed consists of an 81.4 square mile area served by 1,300 miles of combined and separate sanitary sewers. The system serves the St. Louis central business district the northern industrial areas in parts of the city and county. Effluent from the Bissell Point WWTP discharges to the Mississippi River. In 1986 the facility was expanded to provide for third order effluent treatment before discharge.



LEGEND

- Study Area
- Combined Sewer (Storm and Sanitary)
- Sanitary Sewer
- Storm Sewer

April 2012

Scale: 0 0.25 0.5 Miles

NORTH RIVERFRONT COMMERCE CORRIDOR

NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG 5.4 SEWER LINE TYPES

LEGEND

- Study Area
- Pipe Size 30" to 60"
- Pipe Size 61" to 120"
- Pipe Size 121" to 200"
- Pipe Size 201" and Above

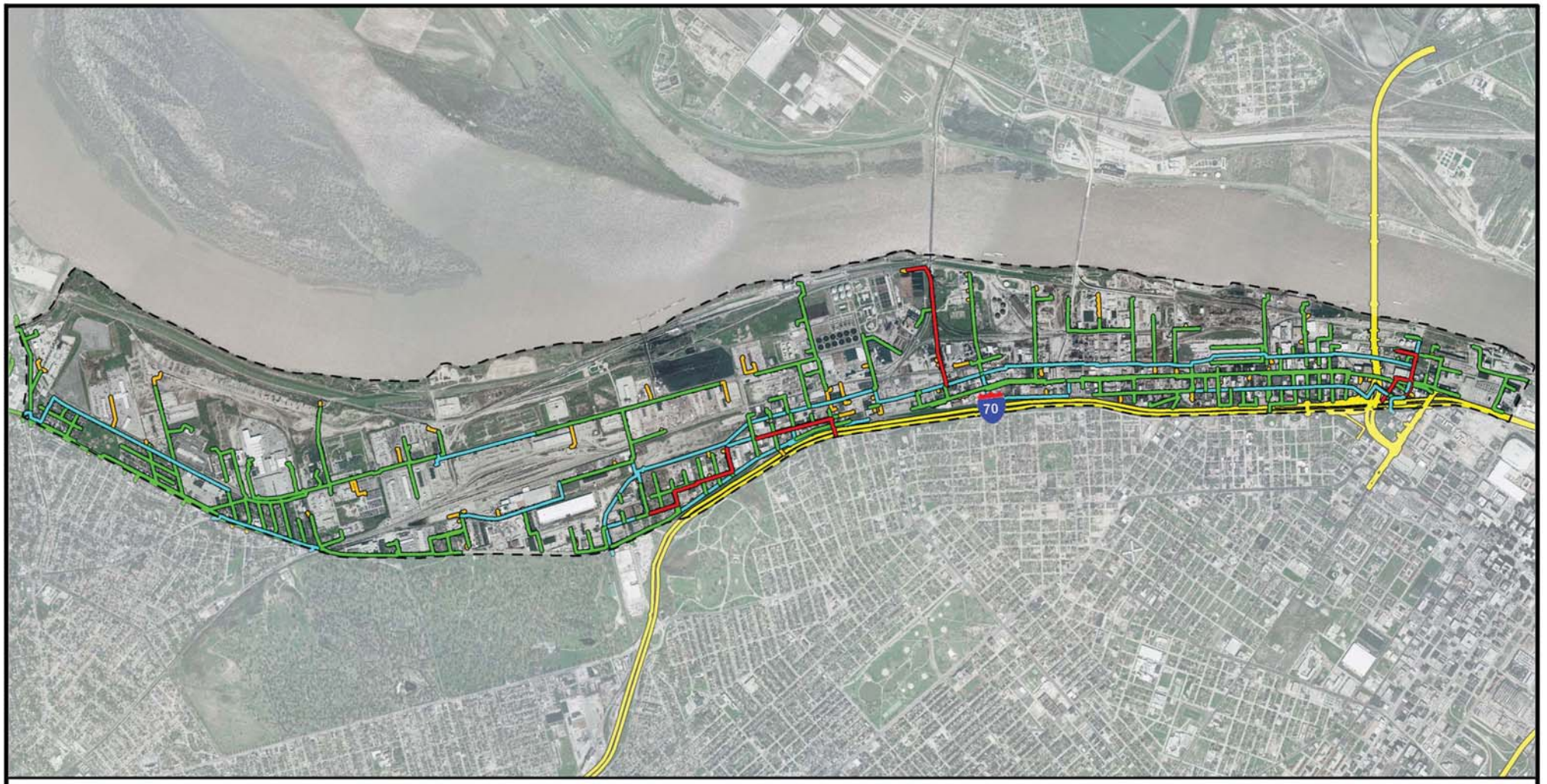
April 2012

Scale: 0 0.25 0.5 Miles

NORTH RIVERFRONT COMMERCE CORRIDOR

NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG. 5.5 MAJOR SEWER LINE SIZES



LEGEND

- Study Area
- Pipe Size 1" to 6"
- Pipe Size 7" to 12"
- Pipe Size 12" to 24"

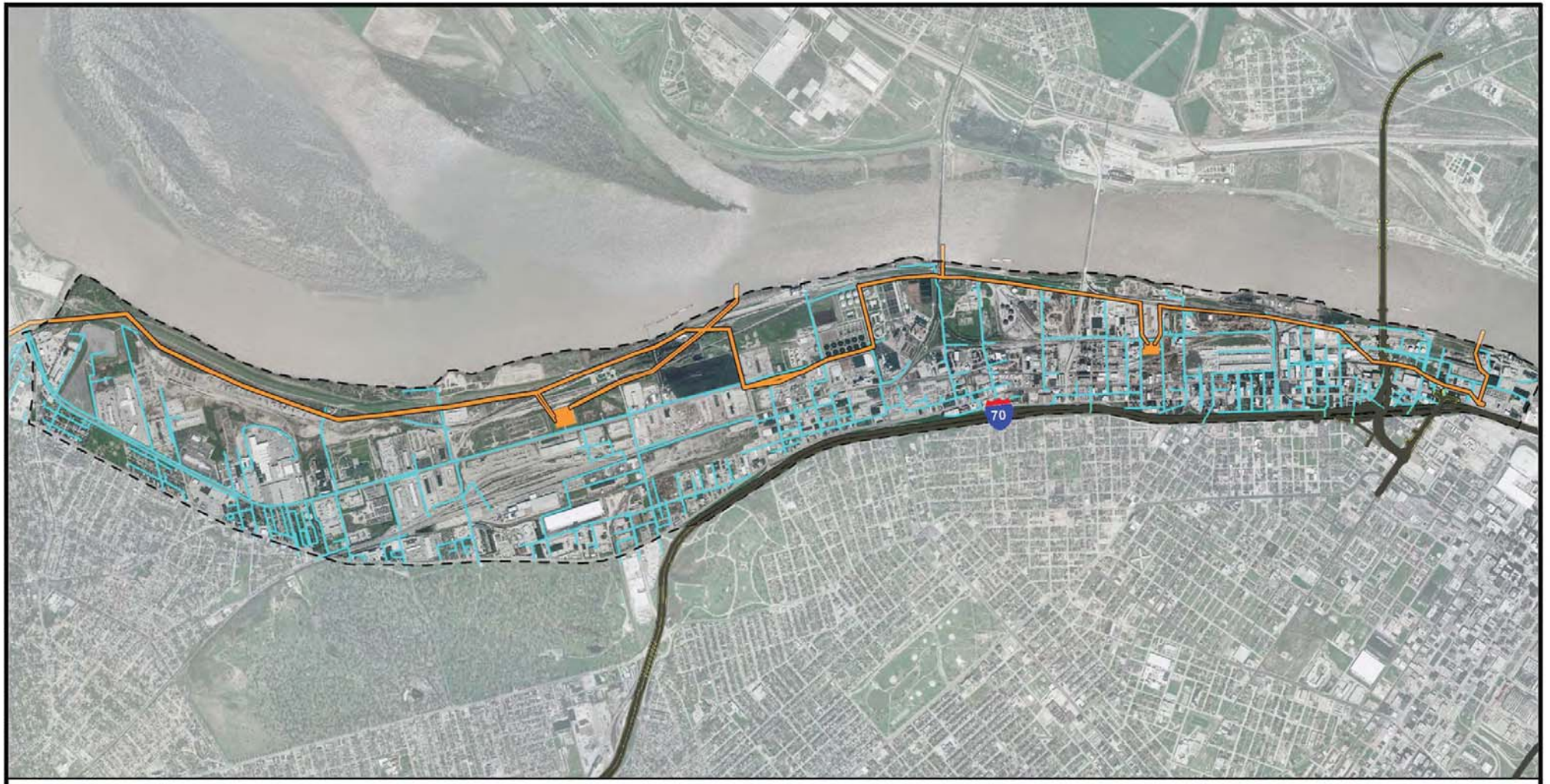
April 2012

Scale:
0 0.25 0.5 Miles

NORTH RIVERFRONT COMMERCE CORRIDOR

NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG. 5.6 GAS SERVICE LINE SIZES



LEGEND

- Study Area
- Overhead Electric
- Overhead HT Electric
- Electric Substation

April 2012

Scale:
0 0.25 0.5 Miles

NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG. 5.7 OVERHEAD ELECTRIC SERVICE LINES

The Bissell Water Treatment Plant (WTP) was put into operation in 1871. Initial pumping capacity of the plant was a mere 65 million gallons of water per day. Operations in high end pumping at the Bissell Plant continued until 1960, when the plant was closed. After closing, the Bissell property was purchased by the MSD. Presently, the Bissell Point WWTP is located where the Bissell WTP once stood. The Bissell Point WWTP was commissioned in 1970 with a permitted design flow of 250 million gallons of water per day and it's the only plant in MSD's system that receives hauled waste from industrial and commercial sources.

To better serve the sewer needs of the community, MSD divided the city and county into watersheds. Eleven of these watersheds partly fall within the NRCC, namely: Maline Creek, Gimblin, Baden, Humboldt, Harlem Creek, Prairie, Ferry, Salisbury, Rock Branch, Chambers South Benton, and Biddle. Most of MSD's customers outside the NRCC are served by separate sanitary and storm sewers.

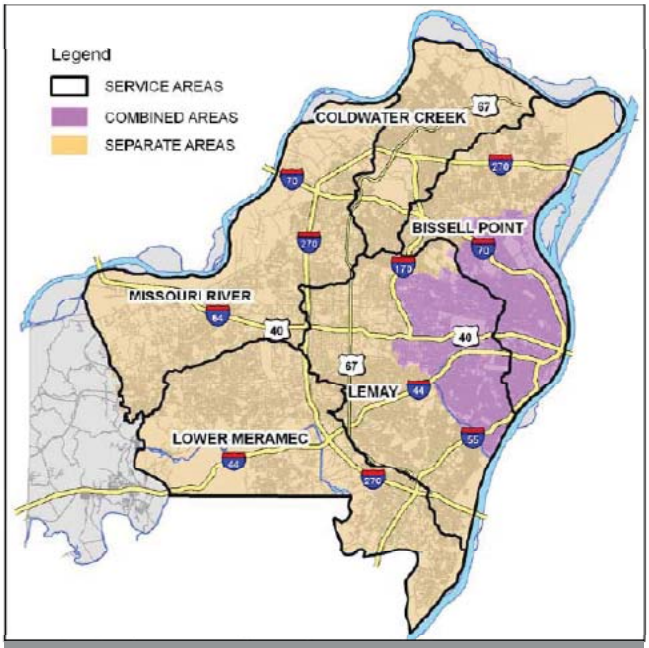


Figure 5.8 - MSD's Service and Combined Sewer Area

During dry weather, the capacity of the combined sewer system is sufficient so that wastewater is conveyed to MSD's wastewater treatment plants. During heavy rainfall, the combination of stormwater and wastewater may exceed the capacity of the combined sewer system. The excess flow, called combined sewer overflow (CSO), is discharged directly to the Mississippi River or to one of the river's tributary streams through permitted outfall pipes. Ten of these outfall structures are located within the NRCC. Although most of the combined sewers predate MSD, they are still the district's responsibility.

Approximately 97 percent of the sanitary and storm sewer lines within the NRCC are combined. In dry weather, the capacity of the combined system is sufficient to convey wastewater to MSD's treatment facilities. However, during heavy rain events, the combined sewers may exceed the capacity of the system. If CSOs were not allowed to occur, the NRCC's streets and businesses would be flooded during heavy rain events. Within the area served by the Bissell Point Treatment Plan, there are 55 locations where overflows may occur during heavy wet weather events. The permits are issued and administered by MDNR.

In 1994, the EPA issued a CSO Control Policy intended to eventually bring CSOs nationwide into compliance with the Clean Water Act. The policy requires agencies with CSO's to prepare a Long-Term Control Plan (LTCP) describing how they will accomplish these goals. MDNR requires updates of the LTCP as a condition of the permits to discharge the outflows. MSD submitted its initial LTCP in 1999 and updated it in 2009. As a recommendation within the 2009 LTCP Update, MSD will invest $100 million in an enhanced green infrastructure program focused on its combined sewer areas within CSOs that are directly tributary to the Mississippi River. The primary objective of this program is to identify and implement projects to significantly reduce CSOs and provide additional environmental benefits. There is a significant opportunity to implement enhanced green infrastructure projects within the NRCC. Low Impact Design (LID) is a development approach that integrates natural design techniques intended to infiltrate, filter, store, evaporate and detain storm run-off at or close to its source.

Per MSD's current policies, separation of sanitary and storm sewers is not a requirement for all development projects. Rather, MSD assesses projects on a case-by-case basis and may require separation based on each site's unique circumstances and needs. The MSD Stormwater Design Criteria requires new development projects to meet pre-construction run-off conditions to the greatest extent practicable, even if the existing site is currently impervious. These requirements add a significant cost for development and redevelopment projects within the NRCC that may offset locational and other advantages. A comprehensive storm water management solution integrating LID and other innovate approaches should be investigated to reduce the burden on individual property owners and to develop a long-term solution that benefits the entire North Broadway Corridor.

Planned Improvements: MSD will require that a stormwater study be prepared for sites by the developer for approval by the agency.

NATURAL GAS

Laclede Gas is the largest natural gas distribution utility in Missouri, serving more than 630,000 residential, commercial, and industrial customers in St. Louis and its surrounding counties of eastern Missouri. Its major lines in the NRCC are located on Broadway and Hall Street and vary in size from eight inches to 24 inches in diameter, as shown in *Figure 5.6.*

Planned Improvements: Laclede Gas has ample capacity for current customers within the NRCC. No known improvement plans are anticipated at this time.

STEAM

Trigen provides services on an as needed basis and is equipped to provide steam and hot water to residential, commercial and industrial establishments. Unfortunately, Trigen does not have any infrastructure north of the current plant location at Ashley Street. Currently, their customers are all located south of the NRCC in downtown St. Louis City. It is currently cost prohibitive for Trigen to expand into the NRCC. Should there be a potential development that has a large steam or hot water need, Trigen should be contacted and asked to commission a feasibility study to determine if facility expansions are warranted.

Planned Improvements: None at this time.

HALL STREET DRAINAGE ISSUES

Flooding along Hall Street through the NRCC continues to be significant issue for adjacent businesses as well as through traffic. Hall Street is a Primary Arterial that bisects the NRCC and provides the primary north-south movement for traffic through the area. In May 2006, MSD completed an investigation of flooding along Hall Street from Riverview Drive and East Grand Boulevard. A summary of the historical context, key issues and potential recommendations are provided.

Historical Background

Hall Street (See *Figure 5.9* for a typical section) was once a marshy area subject to frequent flooding from the Mississippi River. Hall Street was originally constructed above the marshy area on top of two large water conduits, now abandoned, that conveyed water from the Bissell Water Treatment Plant into the City.

When the Corps of Engineers began planning for a floodwall to protect this area, the City identified an opportunity to reclaim this area for industrial development. Over the years, a number of properties adjacent to Hall Street were raised to accommodate new development. Stormwater runoff from these properties were conveyed to Hall Street through a series of natural swales and channels. At the time, developers construed their own storm sewers, either individually or as part of Commercial Taxing Sub-Districts. Because a controlling grade was not established for much of this development, many of the swales and channels become blocked and runoff into Hall Street increased beyond the capacity of the system leading to localized flooding.

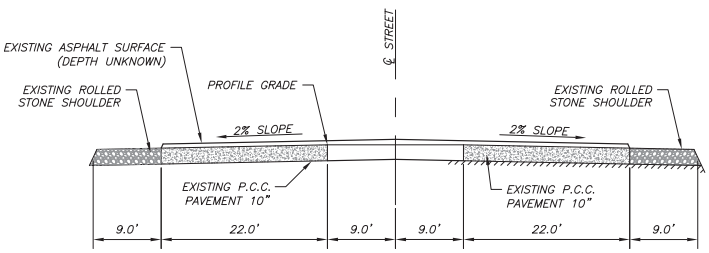


Figure 5.9 - Hall Street Typical Section

PREVIOUS STUDIES

MSD conducted field investigations in 2003 as a result of street flooding and drainage issues on Hall Street. According to this report, the problem area is $4^{1/8}$ miles long and bounded by Riverview Drive and East Grand. Hall Street has approximately 62 feet of pavement with a 9-foot shoulder area along each side. The flooding is due to the fact that there is a lack of graded shoulder away from the driving surface as well as the inability of the grated inlets with side intake to handle the drainage because of their location and the poor road grading. In addition, the average spacing of these inlets is in excess of 400 feet.

Once a marshy area subject to flooding from the Mississippi, the area along Hall Street was never intended for land development.

Other flooding issues were attributed to "Pump failure" in the Harlem System, the Baden System and the Maline System.

MSD concluded that, among other things, the solution to the Hall Street flooding issue will involve:

- the construction of 8 miles of adequately sized storm sewers;
- re-grading of shoulders with curbs;
- stormwater pumping stations;
- construction easements; and
- maintenance of swales.

Key Issues

- Hall Street is essentially flat through the entire NRCC and in many instances is at a lower elevation than surrounding development. Most of the inlets are grated inlets, with side intakes, that were constructed very close to the edge of the pavement and the average spacing of these inlets is in excess of 400-feet.
- The most common cause of the drainage problems along Hall Street is the lack of a graded shoulder, sloping away from the driving surface. In most places, the "shoulder" is higher than the driving surface and the water becomes trapped along the edge of the pavement.
- The water conduits under Hall Street will make the crossing of Hall Street difficult and separate projects for the east and west side will be needed.
- The MoDOT is responsible for the maintenance of the driving surface of Hall Street. The City of St. Louis Street Department is responsible for snow removal, traffic signals and street cleaning.
- There are a number of locations where the existing drainage system incorporates natural swales on private property. Many of these swales have not been maintained and cleaning and re-grading work will be required.

Potential Recommendations

- Drainage improvements include the construction of adequately sized storm sewers, additional inlets that are appropriately spaced and properly graded shoulders and curbs.
- Redevelopment plans adjacent to Hall Street should address improvements to private stormwater systems.
- Use underutilized parcels, natural areas, and/or green stormwater Best Management Practices (BMPs).
- Comprehensive stormwater improvements along Hall Street will need to be coordinated between MSD, MoDOT, the City Street Department and adjacent property owners.

Circulation Analysis

The purpose of the circulation analysis is to provide an assessment of the existing transportation network for the region and the NRCC. This assessment is based on a review of existing transportation plans, discussions with key stakeholders and observations in the field. The analysis was performed at three geographic levels:

- Regional Circulation
- NRCC Circulation
- Hall Street Circulation

Stakeholder meetings were held with the key public and private interests that affect transportation in the NRCC. These stakeholder meetings included the following groups:

- Roadway Stakeholders:
  - MoDOT
  - City of St. Louis
  - East-West Gateway
  - Metro
  - RCGA
- Railroad Stakeholders:
  - Burlington Northern Santa Fe (BNSF)
  - Union Pacific
  - CSX
  - TRRA

Regional Circulation

The NRCC is centrally located within the St. Louis region with direct access to an extensive transportation network (See *Figure 5.10 Regional Transportation*) serving the following modes:

- *Roadway*: Interstate highways, including I-70, provide connections to the local street network within the NRCC. Interstates then provide a high capacity, high speed connection to the region and the United States. See *Figure 5.11 for the NRCC Street Network*.
- *Rail:* St. Louis is the 3rd busiest rail hub in the United States behind Chicago and Kansas City. This rail network crisscrosses the nation moving freight in an efficient manner. See *Figure 5.12 for the NRCC Rail Network* and *5.13 Regional Rail Network*.
- *River:* The Mississippi River is a marine highway moving goods to and from the south through the Gulf of Mexico. The St. Louis port is the northernmost ice-free port along the river route.
- *Inter-modal:* All of these modes work together, including airports, to move freight in and out of the St. Louis metropolitan area.

Legacy 2035 is a long-range vision for how the St. Louis region's surface transportation system will develop over the next three decades. *http://www.ewgateway.org/pdffiles/library/trans/legacy2035/legacy2035.pdf*

The region's Long-Range Transportation Plan is a federally mandated document in order to receive federal transportation funding. *Legacy 2035* was adopted in 2007 and is required to be updated every five-years.

Legacy 2035 provides regional transportation goals developed by policy makers, citizens, and regional planning partners:

- Strong position in the national and global marketplace, ensured through strategic economic development, competitive employment opportunities, a well-trained workforce, and responsible asset management.
- Sustainable and growing economy grounded in the wise and coordinated use of physical, environmental, social, and agricultural resources.
- Clean and healthy environment.
- Safe neighborhoods, communities, and thoroughfares.
- Resources for learning and personal development, accessible at every point of the life cycle.
- Varied and valued outlets for recreation and cultural expression.
- A growing diversified population, with equity, choice, and opportunity for all citizens.
- Efficient and balanced patterns of growth and development that respect the land, the citizenry, the history, and the strategic location of the St. Louis region.

Transportation projects within the region will be evaluated based on their consistency with these goals to establish priorities for funding.

REGIONAL ROADWAY

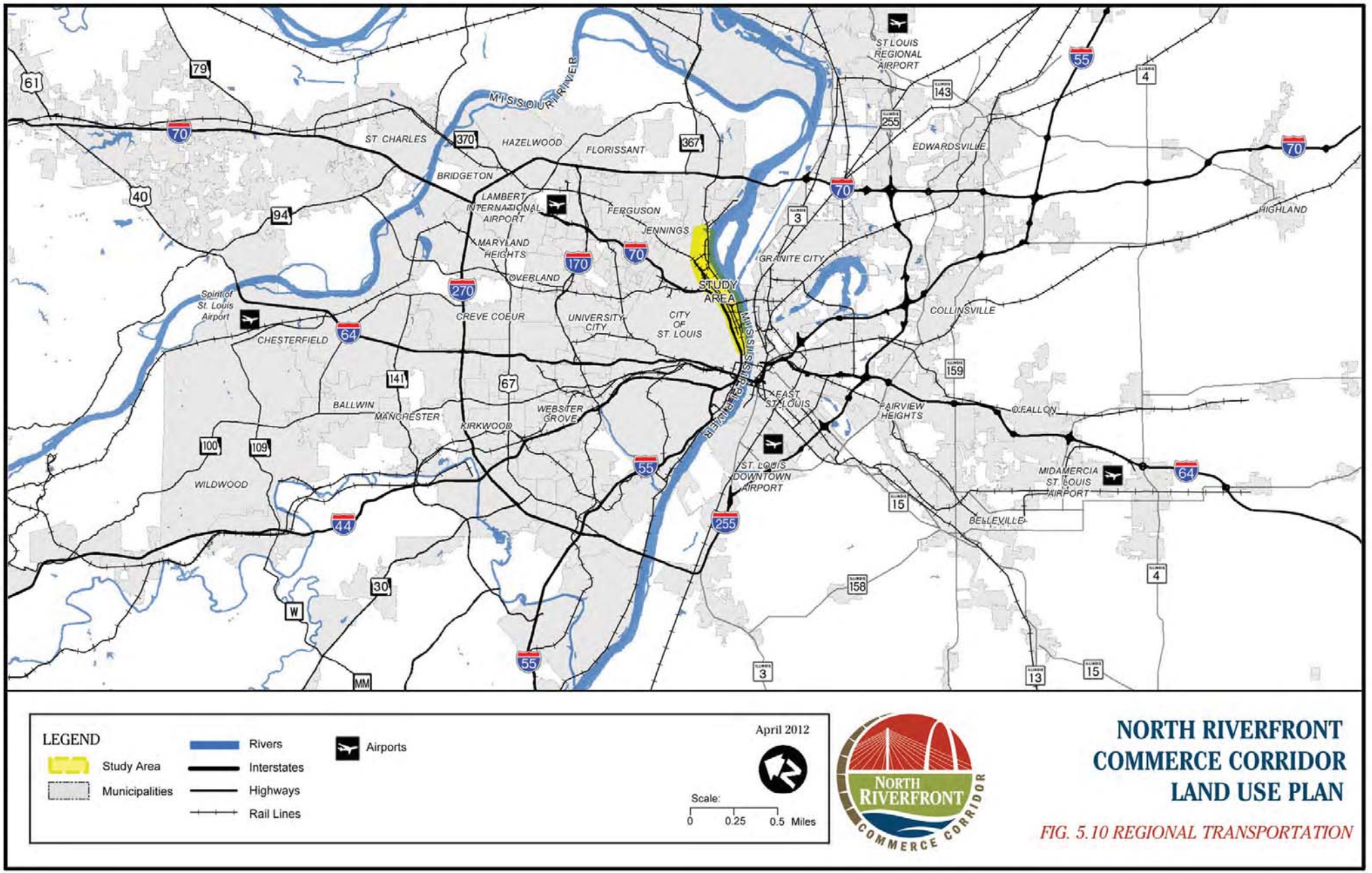
The Midwest and St. Louis region both provide the NRCC with a central location to the transportation network in the United States. This is a strength of the NRCC.

Key Issues

- St. Louis consistently is ranked in the top 10 in the country with the most freeway lane miles per person. This provides motorists with access and mobility opportunities.
- Strong concentration of shippers and receivers in urban core.

However, being located in a metropolitan area the size of St. Louis can also create transportation issues to be addressed.

- St. Louis ranks in the bottom third in commuter delay and congestion cost per motorist. This means that two-thirds of the largest metropolitan areas experience fewer traffic delays and at a lower cost than St. Louis motorists.
- St. Louis ranks 16th when looking at the value of the goods. Truck congestion cost ranks high. This high ranking would add an additional burden to companies located in St. Louis.

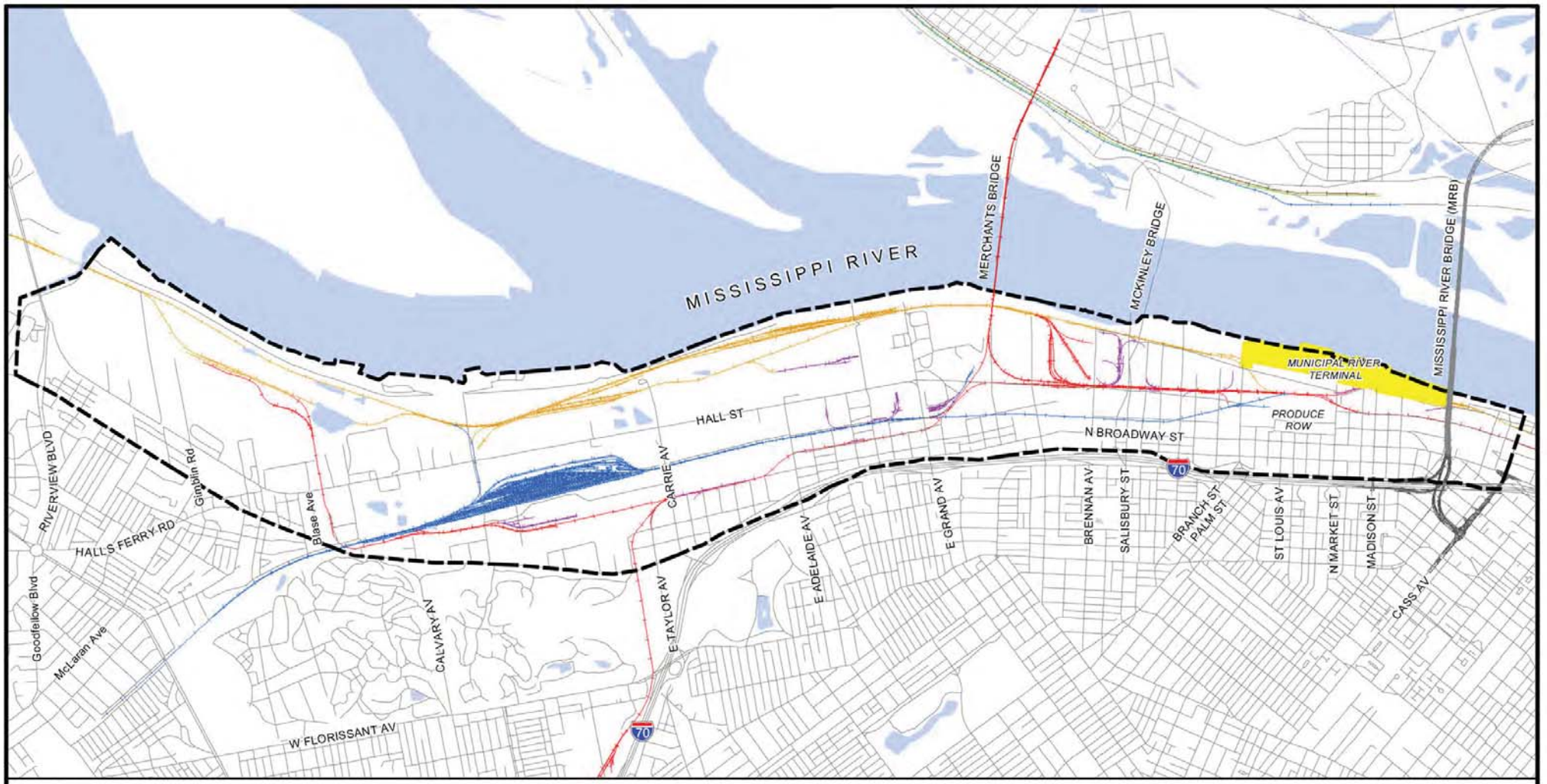


NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG. 5.10 REGIONAL TRANSPORTATION

NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG. 5.11 NRCC STREET NETWORK



LEGEND

- Study Area
- BNSF Rail Lines
- Kansas City Southern Rail Lines
- Norfolk & Southern Rail Lines
- TRRA Rail Lines
- Union Pacific Rail Lines
- Industrial Spur Rail Lines

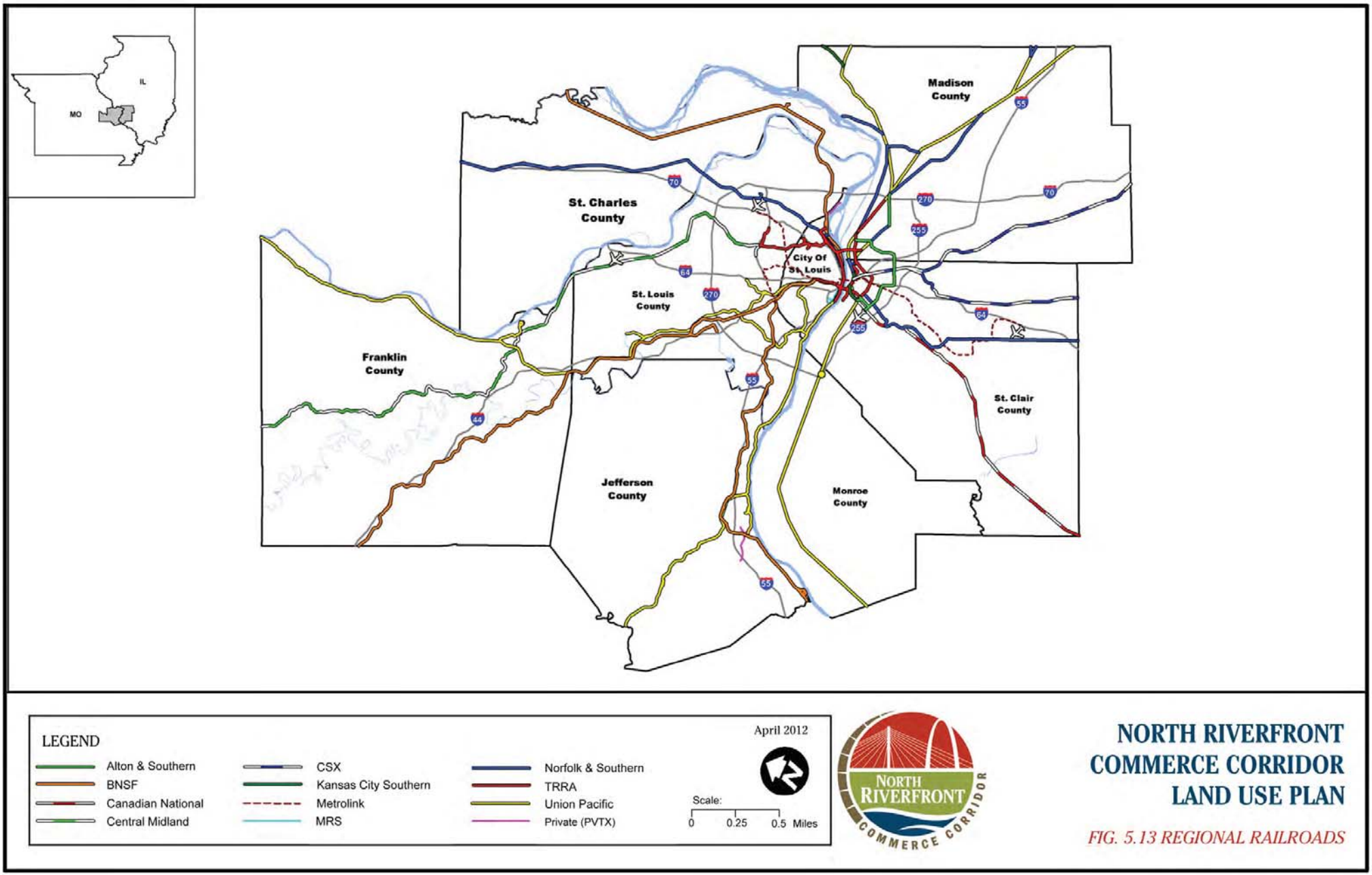
April 2012

Scale: 0 0.25 0.5 Miles

NORTH RIVERFRONT COMMERCE CORRIDOR

NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG. 5.12 NRCC RAIL NETWORK



NORTH RIVERFRONT COMMERCE CORRIDOR LAND USE PLAN

FIG. 5.13 REGIONAL RAILROADS

Table 5.1 provides a summary of how the St. Louis region compares to the top 101 other urban areas in the U.S.

Urban Area Congestion Measure	Rank
Annual commuter delay per motorist	31st
Congestion Cost per motorist	27th
Truck Commodity Value	16th
Truck Congestion Cost	17th
Total Congestion Cost	20th

Real-Timing Urban Mobility Report, University Transportation Center for Mobility, February 2011

Table 5.1 - Urban Area Congestion
Top 101 Urban Areas in America

Potential Recommendations

Regional transportation improvements identified in *Legacy 2035*, can help provide access and mobility to the study area to strengthen is economic stature. Regional improvements would include:

- I-70 Mississippi River Bridge (under construction).
- I-70 Bus Rapid Transit

REGIONAL RAIL

As noted earlier, the St. Louis region is considered the 3rd busiest rail hub in the United States. The central location of the St. Louis region within the United States has supported the development of a vast railroad network. The regional railroad system further enhances inter-modal freight movements through the region by supporting connections to several other freight modes and corridors such as major Interstate corridors and Missouri and Mississippi River barge shipments and port facilities.

- This system of rail infrastructure supports the movement of millions of tons of freight via six (6) Class I railroads:
  - BNSF Railway
  - Canadian National (CN) Railway
  - CSX
  - Kansas City Southern
  - Norfolk Southern
  - Union Pacific

Key Issues

- There are more than a dozen substation and terminal rail facilities within the St. Louis region. This has the effect of "decentralizing" inter-modal freight exchanges
- Inefficiencies in terminal railroad operations create delays in organizing and readying trains for shipments to national and international markets.
- More costly and difficult to change railroad shipping routes to react to changing markets.

NRCC Circulation

One of the strengths of the NRCC is its access to all modes of transportation. The area can be accessed by I-70, by centrally located rail lines such as Norfolk Southern, BNSF, and the Terminal Railroad, or via public and private terminals on the Mississippi River.

NRCC ROADWAY CONNECTIVITY

Travel throughout the area depends on the urban street system managed by the City of St. Louis. This street network includes principal and minor arterials, collectors, and local streets. I-70, a major feeder into this street system, is managed by the State of Missouri. I-70 is classified as an urban principal arterial. See *Figure 5.11* NRCC Street Network.

Conversations with various manufacturing, wholesale trade and transportation, communication and public utilities stakeholders within the area confirm that heavy trucks are the principal means of moving goods throughout the corridor. Trucks account for a significant portion of the total average daily traffic (ADT) of the vehicles in this area. While trucks are the primary source of the movement of goods, there are other transportation options, such as rail and water sources.

The following section provides highlights of the strengths and weaknesses of the NRCC transportation network.

NRCC Transportation Strengths

- Central location.
- No roadway capacity issues.
- Direct regional access via I-70 and indirect access via I-270.
- Future I-70 MRB connection.
- Transit Enhancements.
  - Existing transit transfer facility at Riverview Boulevard opened in 2006. This is one of the heaviest transit dependent sites. There is a park-n-ride lot on site that is secured and the buses that feed in serve the North, West, and downtown areas.
  - Existing transfer facility located at North Broadway and Street and East Taylor Avenue.
  - Current North Broadway Street bus route.
  - The traffic signals at Gimblin and Hall Street are relatively new. These signals have helped with vehicular and truck traffic in the area.
- MoDOT recently upgraded I-70 at Grand Intersection.
- New access road around MRT was recently built for truck queuing road.

NRCC Transportation Weaknesses

- Significant number of trucks accessing the NRCC creates unique challenges.
- North Market Street, the primary route to the MRT, is congested.
- Transit service in the NRCC is limited to the North Broadway route. However, a future Metro station is

planned at St. Louis Avenue. St. Louis Avenue could be key connector into NRCC.

- Lack of sidewalks creates pedestrian mobility deficiencies.
- The Humbolt Avenue rail crossing is major conflict. Limits train to 125 cars. Trains must un-hook. Delays can range from about a 45-60 minutes.
- Poor pavement conditions.
- Some roads such as St. Louis Avenue are too narrow with not enough turning radius for trucks.
- Stopped trains cause delays for motorists blocking truck traffic and emergency vehicles.
- Stacked trucks on primary arterials causes access issues to properties.
- Traffic operational issues at isolated locations (i.e. I-70 at Grand and slip ramps near Madison at St. Louis Avenue).
- Trucks accessing the NRCC from the south will often use downtown city streets.

Figure 5.14 - Trade delays of 30-90 minutes on Grand Avenue as a result of the at-grade rail crossing

Key Issues

The following represent key issues to be addressed based on the strengths and weaknesses identified.

- Improved east-west mobility.
- Improved north access to I-270.
- Grade separated crossings.
- Complete street improvements.
- Improved I-70 access.
- Improved access to and from the MRT via I-70.
- NRCC is a major factor in the regional freight perspective.

Potential Roadway Recommendations

- Improve pedestrian and bicycle connections.
- Improve access to the MRT to support freight movement to and from the regional transportation network.
- Improve roadway geometrics to better accommodate trucks.
- MRB – Will be the new front door - providing direct access to Tucker and downtown.
- Poplar Street Bridge – Rebuild after MRB and upgrade other local connections.
- Street network improvements identified in the *2003 North Riverfront Business Corridor Plan*.

Potential Transit Recommendations

- Increased transit service in the NRCC. Redevelop Hall Street transit route.
- Metro is planning Bus Rapid Transit (BRT) on I-70, but currently there are no plans for stops within the NRCC.
- Opportunity for ITS to direct traffic to underutilized or alternative routes such as Adelaide instead of Grand.
- Merchants Bridge is not in good condition and needs $150 million in repairs. TRRA is planning improvements.
- Metro North/South Light Rail – Proposed station at St. Louis Avenue may consider Transit Oriented Development (TOD)/sustainable strategies as part of East West Gateway sustainability grant.
- North Broadway Street has limited shoulder width for bus stops, especially at the intersection of East Grand Avenue and North Broadway Street.

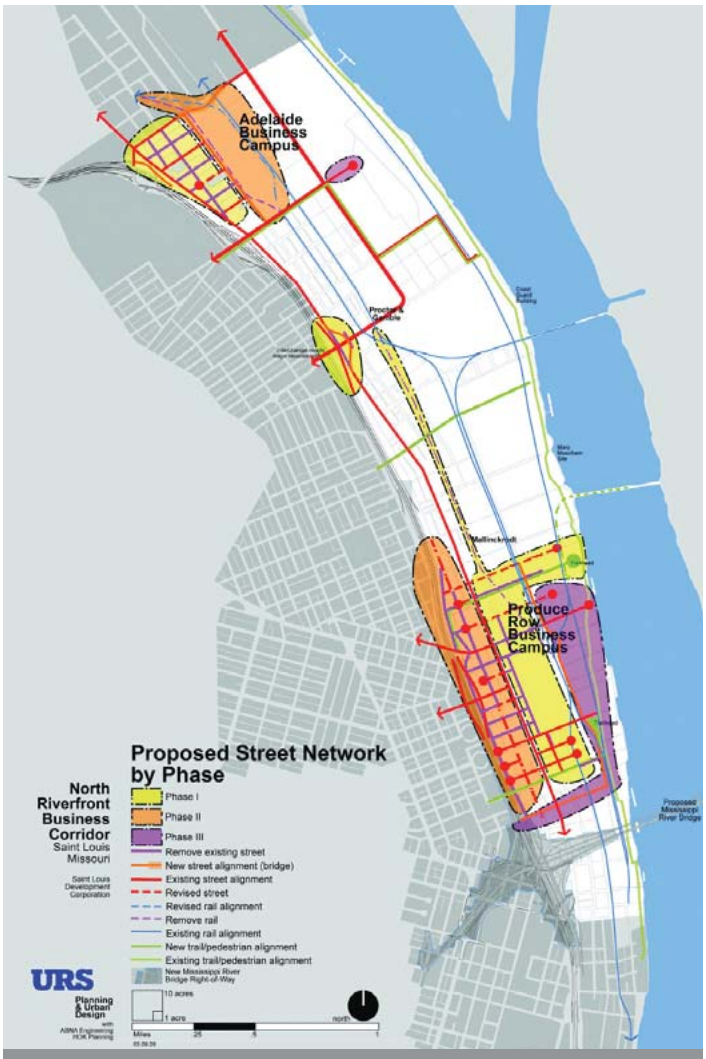


Figure 5.15 - 2003 North Riverfront Business Corridor Plan Street Improvements

Potential Policy Recommendations

- The NRCC must leverage federal dollars to perform basic improvements that are difficult for the City to do with limited funds and budget cutbacks.
- Long Range Plan improvement for Riverview Road from I-270 to Hall Street. It has been on long range plan.

The new Mississippi River Bridge (MRB), expected to be completed in 2014, will have a dramatic impact on circulation around the NRCC. The MRB will be the new front door providing direct access to Tucker and downtown.

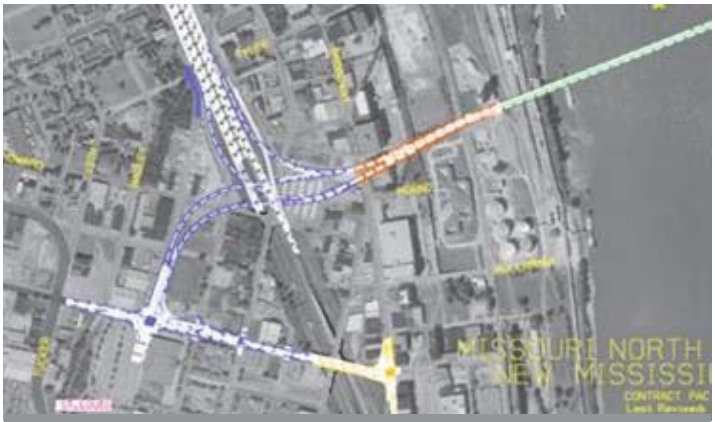


Figure 5.16 - Mississippi River Bridge

The Mississippi River Bridge will provide an interstate connection to and from I-70 west as well as a local street connection at 11th Street and Cass Avenue. Motorists wanting to access the NRCC will then travel east on Cass Avenue and then north on North Broadway Street. Most stakeholders interviewed indicated that the new bridge would have a positive impact on their businesses and the movement of freight.

NRCC RAIL CONNECTIVITY

As noted above, the primary means of moving freight in and out of the NRCC is via trucks. However, one of the major strengths of this area is its connections to major railroad shipping lines. See *Figure 5.12* NRCC Rail Network for the location local rail lines.

Within the NRCC, both the BNSF and Norfolk & Southern Class I railroads operate sizeable switching facilities. Freight rail cars are switched from one track to another to access different destinations and markets. The TRRA provides access to all five Class I railroads. Since its formation in 1889, the TRRA has been developed into a regional facilitator for interchanging rail traffic. TRRA's primary switching yards are located east of the Mississippi River in Madison, Illinois. Rail access from the NRCC is through the existing MacArthur and Merchants bridges.

Key Issues

While there are several advantages to having railroad access to such a large network of Class I railroads from the NRCC, there are some key issues and concerns related to the use of the existing rail network.

- Existing industrial rail spurs lack availability of adequate storage to assemble longer trains.
- Rail corridors run parallel to the primary road system, creating few opportunities to relocate streets and assemble larger development lots.
- Several rail/roadway crossing points create bottleneck and safety issues for both truck and railroad operations.
- General lack of grade-separated crossings of the railroad within the NRCC.

HALL STREET CIRCULATION

Hall Street is a major north/south four lane arterial with a center turn lane that runs parallel to North Broadway Street. Classified as an urban principal arterial, its primary function is to provide long distance trips throughout a transportation corridor. Hall Street's southern limits are restricted at East Grand Avenue by P&G and the MSD's Bissell Treatment Plant. Hall Street is a primary north/south truck route and therefore, requires adequate pavement and turning radii to serve large vehicles.

Key Issues

Hall Street has historically had significant flooding problems. The transportation key issues and concerns are listed below.

- Poor pavement on Hall Street according to the East West Gateway's LRTP.
- Drag racing and speeding on Hall Street.
- Truck storage queues in the center turn lane.

Figure 5.17 - Truck Queues on Hall Street

Potential Recommendations

- Improve Hall Street and Riverview Boulevard to provide better connection to I-270. This is listed as a recommendation in *Legacy 2035*.
- Construct linkages identified in the *2003 North Riverfront Business Corridor Plan.*
- Design and deploy real-time ITS signage to notify motorists of intersections blocked by trains.

Freight Analysis

Analysis of Freight Operations

The following section examines freight operations and commodity flows for the NRCC and region. Freight studies have been on-going in the area for some time. Therefore, this assessment summarizes freight commodity flows examined in existing studies and summarizes freight stakeholder's viewpoints on freight strengths, weaknesses, opportunities and threats for the NRCC and region that affect the NRCC.

FREIGHT COMMODITY FLOWS

The team inventoried freight commodity flows including facilities for highway, rail, river, air, and inter-modal. Freight operations and commodity flows for the NRCC were developed from existing studies.

A. *Phase 1 and 2 Jefferson County Study*
B. *Missouri River Freight Study*
C. *RCGA Regional Cluster Analysis*
D. *RCGA Global Freight Hub*
E. *I-70 Dedicated Truck Lane O-D Study and St. Louis Truck Lane Corridor Study*
F. *Ameren Wholesale Study*
G. *Market Analysis for Bulk, Liquid and Containerized Cargo* (See Chapter 4)
H. *St. Louis Region TIGER II Application, Enhancing Freight and Commerce*
I. *East-West Gateway Regional Transportation Plan*

A. PHASE 1 AND 2 JEFFERSON COUNTY STUDY

Jefferson County Port Authority, based in Hillsboro, Missouri, south of the St. Louis metropolitan area, is a part of the economic development agency of Jefferson County that is seeking to develop one or more public port facilities within their jurisdiction. In 2010, Jefferson County Port Authority prepared a report to explore land redevelopment opportunities for various sites on the Mississippi River with the objective of creating a cluster of public port facilities, private port and waterfront developments and public-private partnership land redevelopment and economic development opportunities.

From a commodity flow perspective, the PMSL is the country's third largest inland river port and the country's 25th largest port (of all inland, coastal and great lakes ports). The cargo facilities within PMSL handled 32.1 million tons of cargo in 2007, comprising 23.5 million tons of outbound cargo, 6.3 million tons of inbound cargo, and 2.4 million tons of intra-port cargo (that is, cargo moving within the area covered by the Port). Total cargo was higher than in 2006 and 2005, but lower than the peak of 34.4 million tons reached in 2001. Annual cargo volume is influenced by a variety of factors, including economic conditions, crop yields and production, specific shipper requirements, and construction activity.

Total cargo is dominated by four commodity groups – coal, food and farm products (corn, soybeans, wheat and other farm products), petroleum and petroleum products, and crude materials (sand and gravel, iron and steel scrap, and others), which together accounted for 89.3 percent of total tonnage in 2007. These are all lower-value bulk commodities suitable for shipment by barge. Two other commodity groups – primary manufactured goods (which includes cement, and iron and steel products) and chemicals and related products – accounted for 10.6 percent of total cargo in 2007.

The dominant directional flow is outbound shipments of cargo from the Port. Total outbound shipments were 23.5 million tons in 2007. Inbound cargo is tied to local and regional economic activity, and amounted to 6.3 million tons in 2007.

Improved port facilities in Jefferson County, Missouri may provide a regional benefit to the area. Increased freight along the Mississippi River could provide opportunities for port partnerships or the shipments of additional commodities by waterway that benefit the MRT and the region as a whole.

B. MISSOURI RIVER FREIGHT STUDY

The Missouri River Freight Study's purpose is to better understand the untapped freight transportation asset of the Missouri River for Missouri and the United States. From 2001 through 2008, river management strategies and continued drought conditions resulted in high-risk, low-reliability shipping on the river. This prolonged period of instability and risk pushed traditional river freight to other modes – rail and highways, as well as other river systems. Current circumstances and expectations for transportation in the future again point to the Missouri River as a transportation solution and economic development engine.

With increased congestion on our highways and rails combined with transportation-related environmental concerns, moving freight on the Missouri River can result in a range of benefits in three critical areas:

1. *Transportation System Capacity and Congestion*: Freight movement on the river provides an opportunity to level freight loads across other modes, allowing continued efficiency on highway and railway systems
2. *Environment*: Freight movement on waterways is the safest, cleanest, and most efficient mode of freight transportation.