



# Eco-Logical Approach to Infrastructure Development Initiative

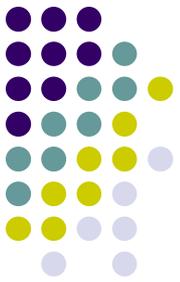


May 12 & 14, 2010

Eco-Logical Initiative Technical Meeting



EAST-WEST GATEWAY  
Council of Governments



# East-West Gateway



- **Metropolitan Planning Organization (MPO)**
- **8 County Bi-State Region (5 MO/3 IL)**
- **29 total members/25 Voting – Chief Elected Officials**
- **Responsible for developing long and short-range plans to guide investment in and development of St. Louis region's transportation system**
- **Long-Range Transportation Plan: Legacy 2035, June 2007**
  - 4 yr update cycle - next plan due by June 2011!
  - Sets policy direction
  - 20 years + (2040)



# SAFETEA-LU Requirements

- **Consultation and Cooperation:**

- MPOs and States shall consult with local/State land use management, natural resource, historic and other agencies in the development of transportation plans.
- Consultation shall involve comparison of LRTPs with State conservation plans or maps; and/or Inventories of natural or historic resources.

- **Environmental Mitigation Activities:**

- Metropolitan and statewide transportation plans shall include “discussion” of environmental mitigation activities.
- This “discussion” shall be developed with Federal, State, and Tribal, wildlife, land management, and regulatory agencies.

# Transportation Planning Process

## Regional (Metropolitan) Transportation Plan

- Goals & Objectives
- Planning Framework
- Needs Assessment
- Project & Corridor Improvements
- Financial Capacity
- Air Quality Conformity

## Community Engagement

- Public Information
- Consultation
- Process Evaluation

## Transportation Project Planning

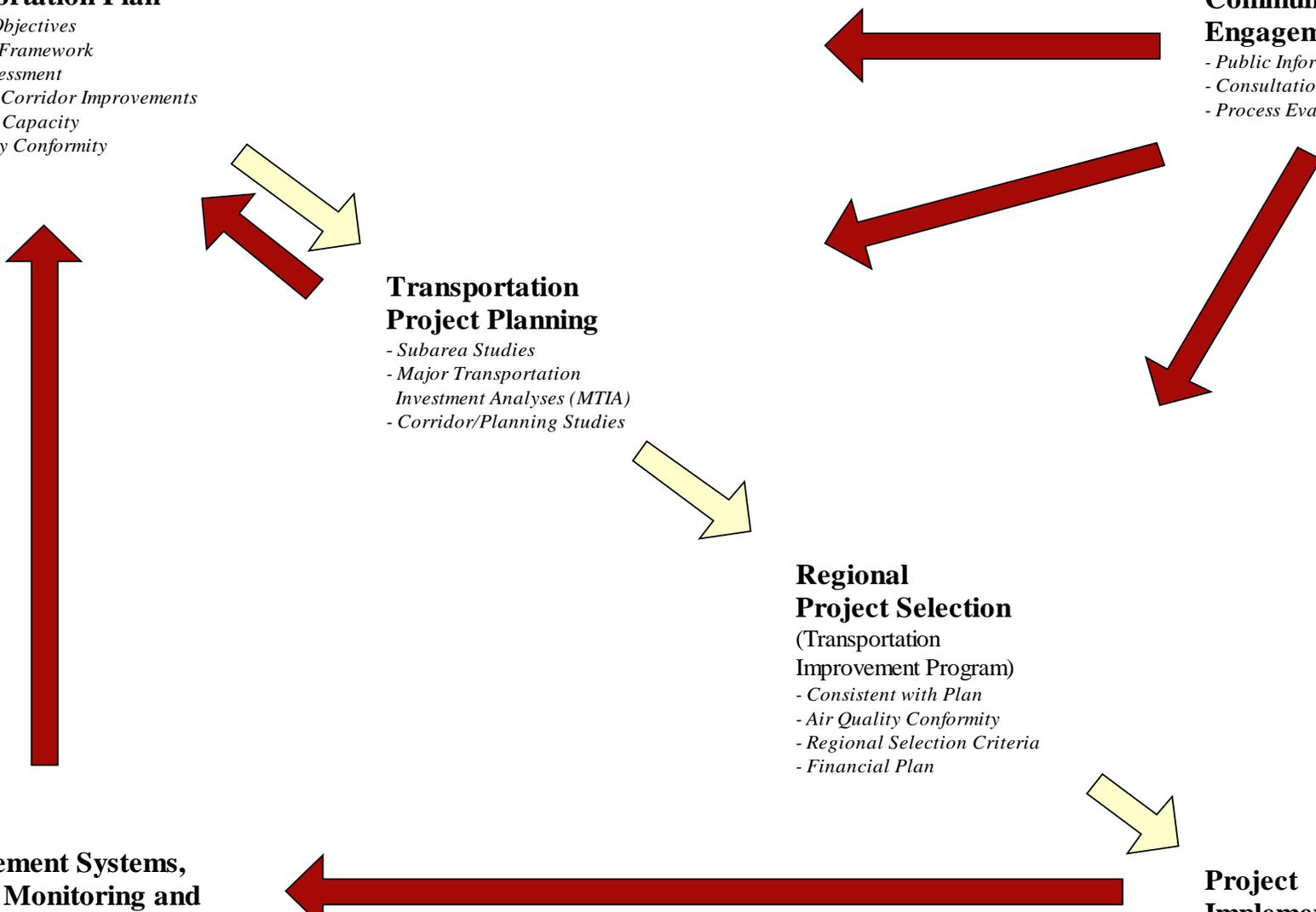
- Subarea Studies
- Major Transportation Investment Analyses (MTIA)
- Corridor/Planning Studies

## Regional Project Selection

- (Transportation Improvement Program)
- Consistent with Plan
  - Air Quality Conformity
  - Regional Selection Criteria
  - Financial Plan

## Management Systems, Project Monitoring and Performance Evaluation

## Project Implementation





# New Opportunity



- To advance regional sustainable development and resource conservation goals and priorities through proactive thinking about the long-term impacts of transportation investments on natural, cultural, and historical resources.
- To improve coordination and planning in St. Louis
- To utilize “state of the art” analytical tools to better understand trade-offs of investment decisions and inform decision-making
  - Utilize GIS to compare local and State conservation plans and inventories of natural and cultural resources to LRP
  - LEAM (Land-use Evolution and impact Assessment Model) – cumulative impact assessment
  - Development Stress Analysis on environmentally sensitive areas (MoRAP is developing)



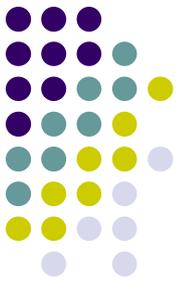
# Partner Resource Agencies



- USACE
- US F&W
- USDA/NRCS (MO)
- USDA/NRCS/SWI RC&D
- US EPA Regions 5 & 7
- National Park Service – Jefferson Memorial
- Mo & IL DNR
- IL EPA
- MO Dept Conservation
- IL Historic Preserv. Agcy
- IL Dept of Agriculture
- Metro East Parks Dist.
- Great Rivers Greenway
- Metropolitan Sewer Dist.

And the list of partners is growing!

# Natural Resource Inventory & State Conservation Plans



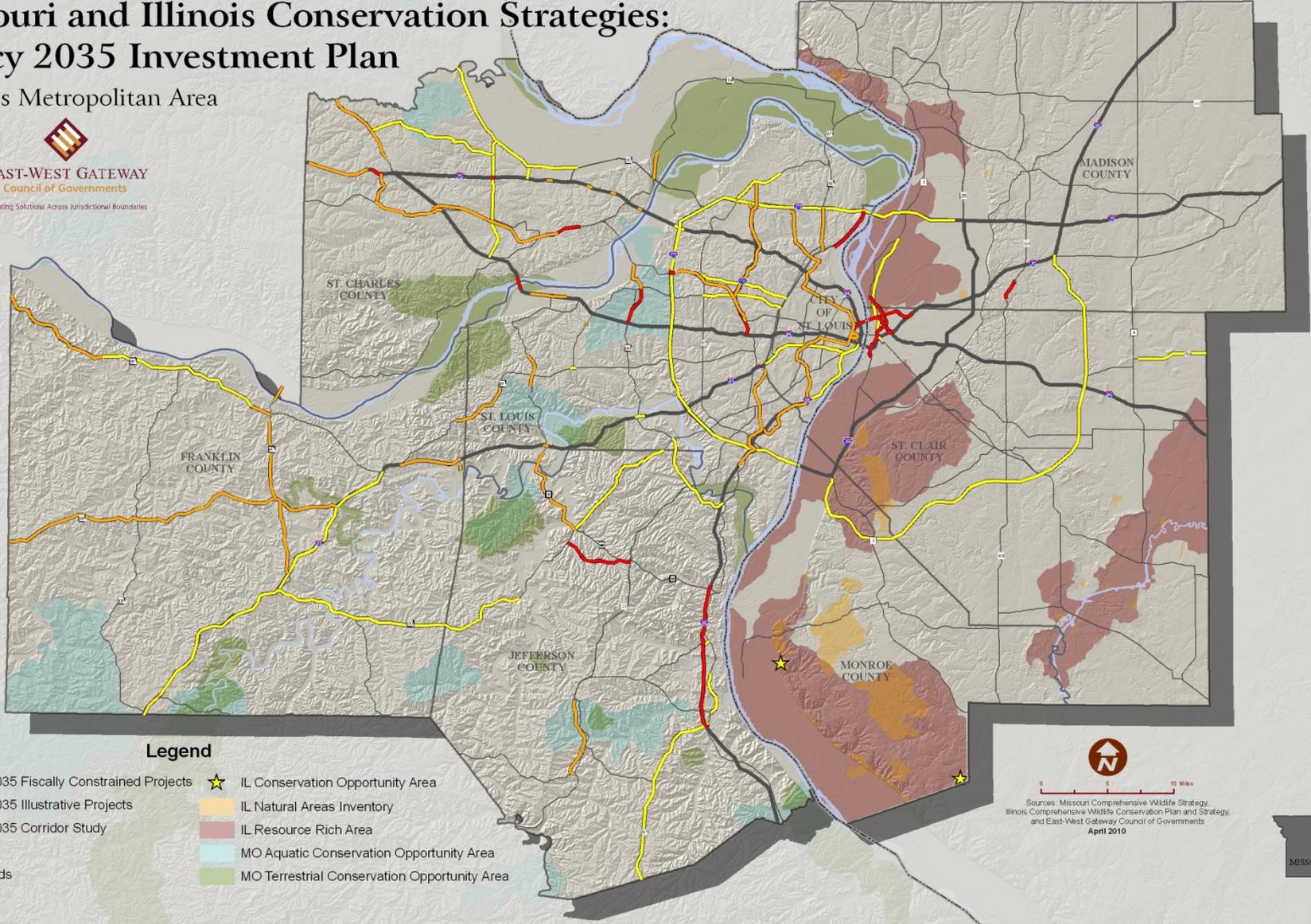
- Watersheds
- Prime farming soils
- Karst soils/areas
- Floodplain
- Threatened and endangered species
- Sites listed on the National Register of Historic Places
- Protected land
- Wetlands
- Land Cover
- 303(d) streams/ All Streams
- Centennial farms(IL only)
- TNC portfolio sites
- Illinois Comprehensive Wildlife Conservation Plan and Strategy
  - Resource rich areas
  - Natural Areas Inventory
  - Conservation Opportunity Areas
- Missouri Comprehensive Wildlife Strategy
  - Terrestrial and Aquatic Conservation Opportunity Areas
- Metro Park District Plans
  - Greenways
  - MetroEast parks & trails
- East St. Louis and Vicinity Ecosystem Restoration and Flood Damage Reduction Project

# Missouri and Illinois Conservation Strategies: Legacy 2035 Investment Plan

St. Louis Metropolitan Area



**EAST-WEST GATEWAY**  
Council of Governments  
Creating Solutions Across Jurisdictional Boundaries



## Legend

- Legacy 2035 Fiscally Constrained Projects
- Legacy 2035 Illustrative Projects
- Legacy 2035 Corridor Study
- Highway
- Main Roads
- Rivers
- ★ IL Conservation Opportunity Area
- IL Natural Areas Inventory
- IL Resource Rich Area
- MO Aquatic Conservation Opportunity Area
- MO Terrestrial Conservation Opportunity Area



0 5 10 MINS

Sources: Missouri Comprehensive Wildlife Strategy,  
Illinois Comprehensive Wildlife Conservation Plan and Strategy,  
and East-West Gateway Council of Governments  
April 2010

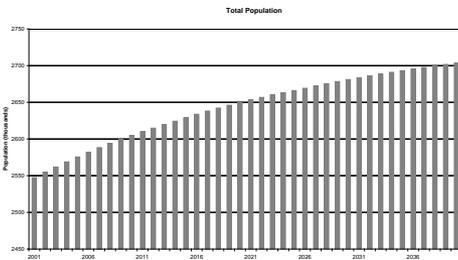


# LEAM



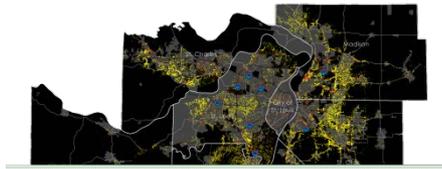
LEAM is a suite of models used to simulate land use change and associated impacts for a region

## Land Use Demand



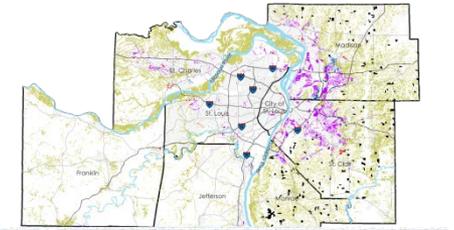
- Calculation of regional demand for residential and commercial land uses (non-spatial)
- Model results are derived from census and other demographic information
- In advanced applications of LEAM this information comes from a customized Regional Econometric Input-Output Model

## Land Use Allocation



- Using the land use demand, a set of models allocates development across the region at a 30m x 30m scale
- Allocation is based on a set of land use change drivers identified for the region
- A development probability map is created to determine cells with the highest likelihood to develop
- Land use allocation is simulated on a yearly basis

## Land Use Impacts



- Land use change results can be analyzed with various approaches to assess the impacts on the region
- Impact analyses include LEAM developed impact models as well as the ability to link LEAM results with externally-developed impact models
- The 30m x 30m resolution of LEAM results allows aggregation up to almost any spatial resolution

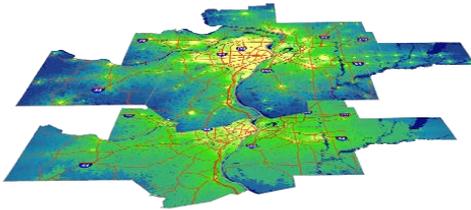


# LEAM: Land Use Allocation

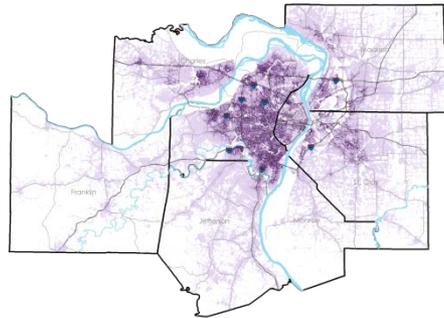
Land use change is based on the land use probability map derived from various drivers in LEAM

## Land Use Allocation

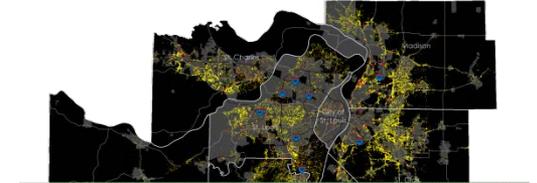
Land Use Driver  
Attractor Maps



Development  
Probability Map



Land Use  
Change Map

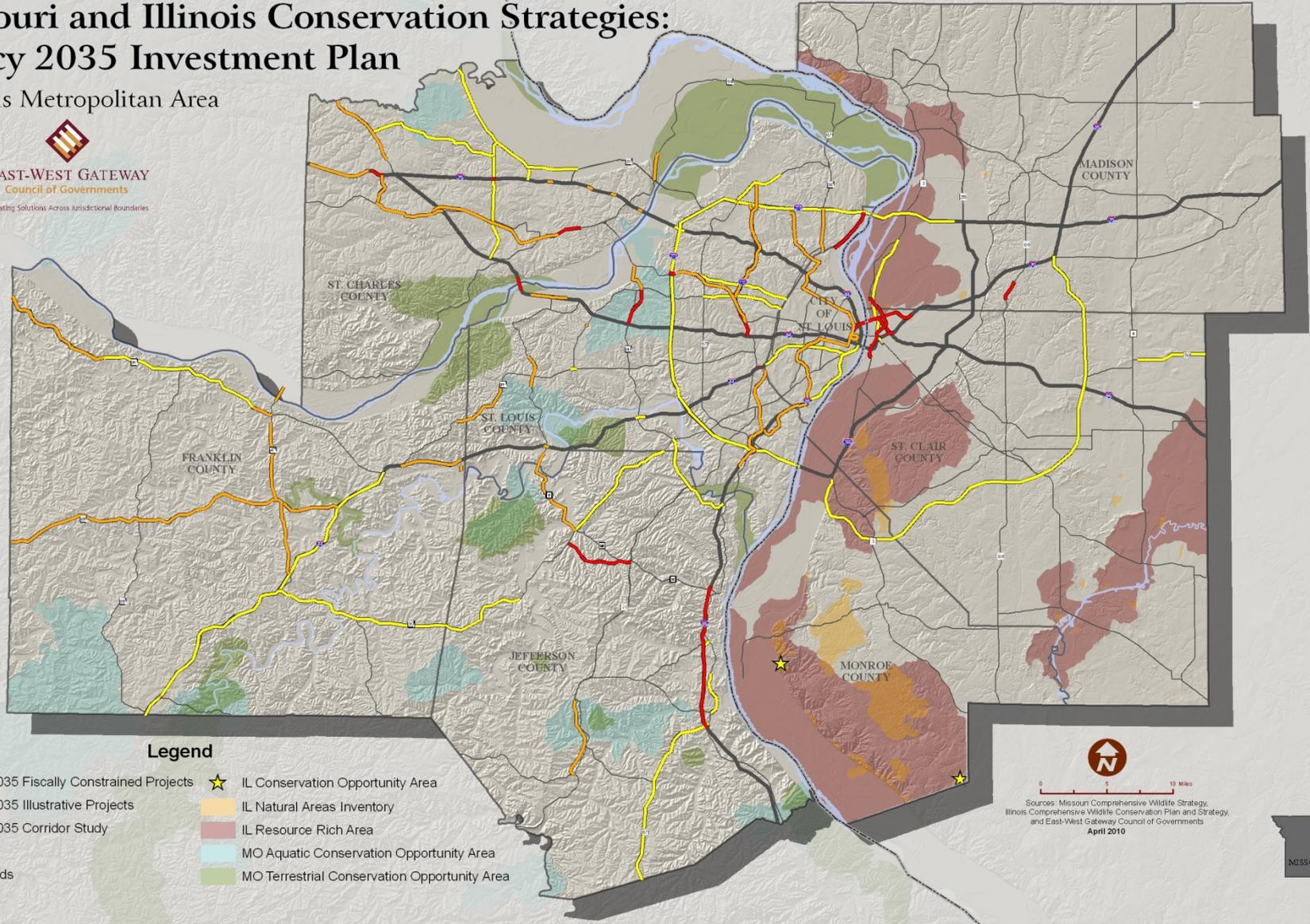


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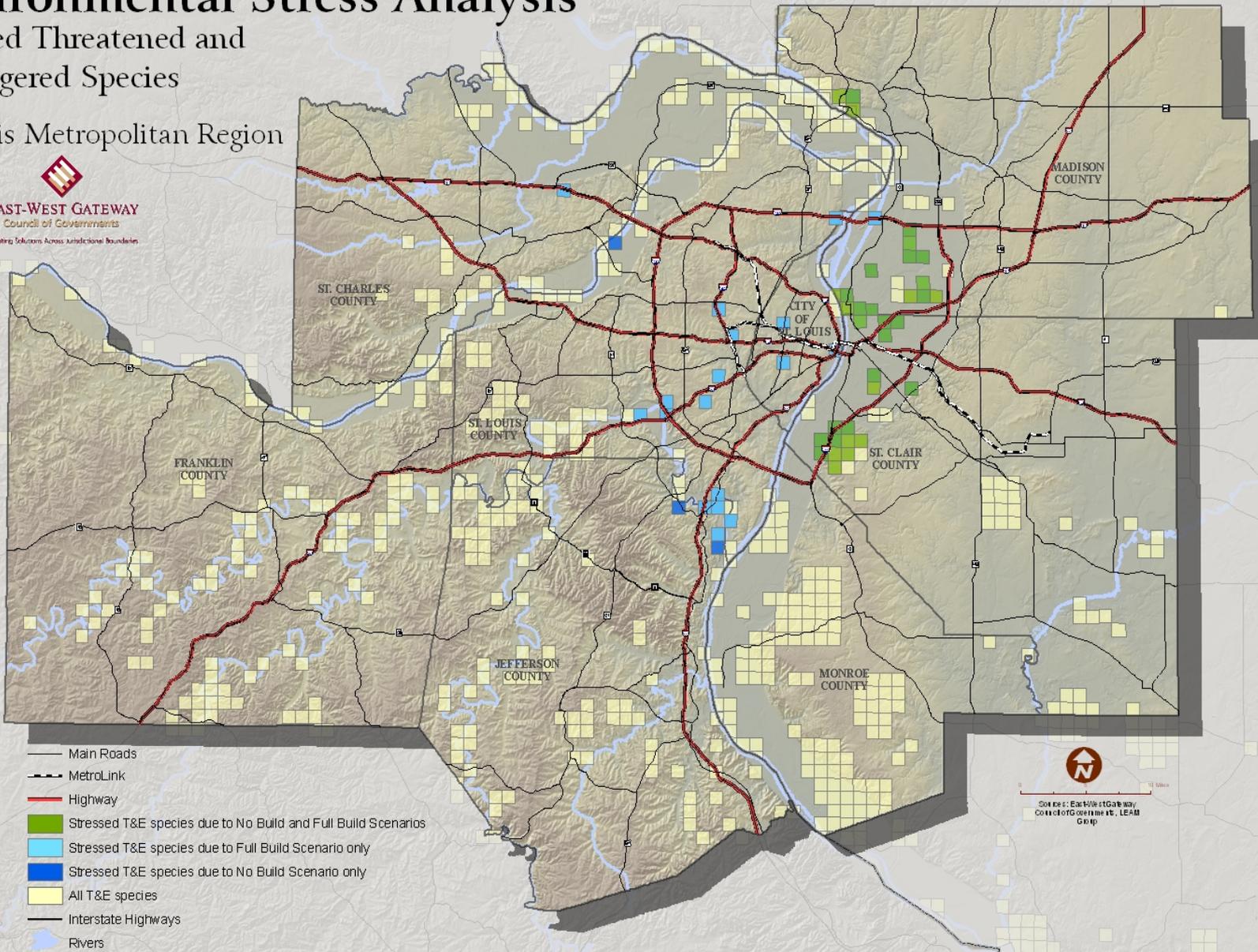
  
 0 5 10 Miles  
 Sources: Missouri Comprehensive Wildlife Strategy,  
 Illinois Comprehensive Wildlife Conservation Plan and Strategy,  
 and East-West Gateway Council of Governments  
 April 2010



# Environmental Stress Analysis

## Stressed Threatened and Endangered Species

### St. Louis Metropolitan Region



- Main Roads
- - - MetroLink
- Highway
- Stressed T&E species due to No Build and Full Build Scenarios
- Stressed T&E species due to Full Build Scenario only
- Stressed T&E species due to No Build Scenario only
- All T&E species
- Interstate Highways
- Rivers







# Eco-Logical: Ecosystem Approach





# Goals of Ecosystem Approach



**Conservation** - Protection of larger scale, multi-resource ecosystems

**Connectivity** - Reduced habitat fragmentation

**Predictability** - Knowledge that commitments made by all agencies will be honored / More efficient project dvpt

**Transparency** - Better public and stakeholder involvement at all key stages



# Regional Environmental Framework



- Create *Ecological Significance data layer* that identifies and prioritizes areas of ecological significance and overlay with other environmental, cultural, and historical asset
- Utilize with LEAM/TransEval to evaluate direct and cumulative impacts of LRTP investment plan on areas of significance to assist with development of mitigation planning strategies
- Utilize Ecological Significance data layer as planning tool at all levels of transportation planning process: LRTP/TIP/Corridor planning and share with planning partners, and local governments for use.



# Ecosystem Based Mitigation

*“The process of restoring, creating, enhancing, and preserving habitat and other ecosystem features in conjunction with or in advance of projects in areas where environmental needs and the potential environmental contributions have been determined to be greatest”*

- Departure from project by project mitigation planning
- Extend compensatory mitigation options by offering ways to evaluate alternatives for off-site mitigation and/or out of kind mitigation
- Develop ways of crediting mitigation that builds upon current approaches
- Improve habitat connectivity and wildlife conservation while developing needed infrastructure





# Process/Project Timeline



- LRTP update due for adoption by June 2011
  - 12 months
  - Draft LRTP doc April 2011
- Consultation with resource agencies
  - Policy and Technical focused meetings
  - 3-4 meetings
- Complete development of regional environmental framework
  - Final draft ecological significance file (Nov/Dec 2010)
  - Perform analysis – evaluate impacts for investment scenario
  - MoRAP to package data for use by partners and local governments; perform staff training etc..next fiscal year (June2011-2012)