CHAPTER 4: ROADWAY VISION

INTRO

The roadway network forms the backbone of the entire multi-modal transportation system in Champaign. In addition to automobiles, roads accommodate transit, bicycles, and pedestrians and commercial vehicles carrying freight on these roads. Streets and highways are an important part of the local and national economy, and they provide mobility for most ground transportation users.

Historically, the automobile and roadway construction have dominated transportation investments in the City. Roadway improvements will continue to be an issue, but a balanced system of modes is desired. For the foreseeable future, the automobile will likely continue to be the primary mode of transportation. The roadway network must continue to be maintained and improved to keep pace with growth.

Champaign Moving Forward's Roadway Vision is based on the hierarchical designation of streets and highways in the City's existing development code. Proposed land use policies and transportation relationships were integrated to identify this Roadway Vision. In this manner, a balance between future land uses and congestion levels was used.

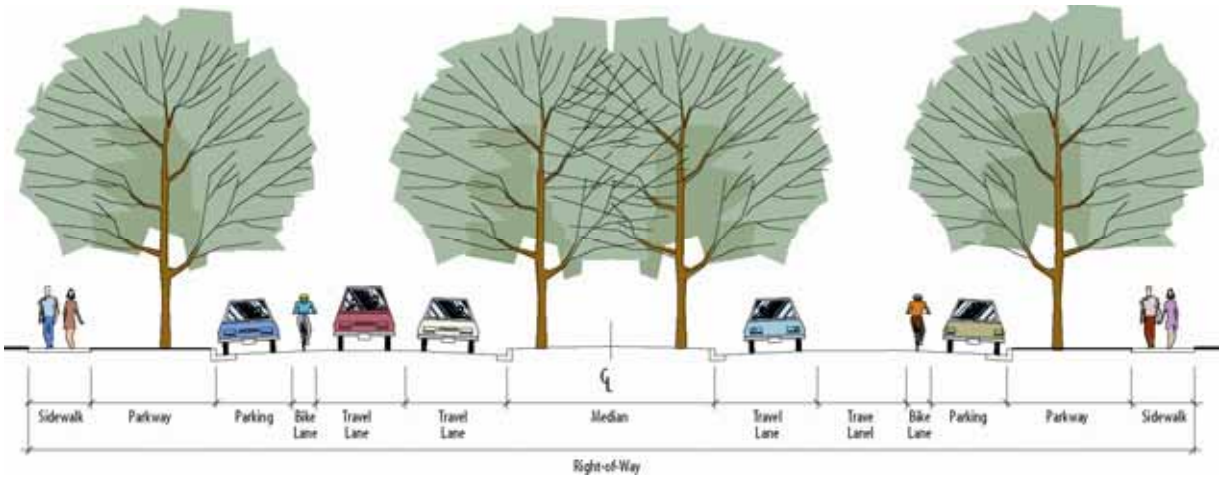
ISSUES

Several issues were identified as part of the roadway system analysis. They include:

- Identifying and addressing major traffic concerns;
- Funding of current deficiencies and need created by future development;
- Utilizing roadway corridors to support additional multi-modal use; and
- Establishing a balance between roadway capacity and land access for arterial streets.

COMPLETE STREETS

In 2000, the Federal Highway Administration (FHWA) provided the following guidance: "Bicycling and walking facilities will be incorporated into all new transportation projects unless exceptional circumstances exist." Since then, cities and counties throughout the country have started working toward providing "complete streets" in their communities. A complete street is one that works for all travel modes, including motorists, transit, bicyclists, and pedestrians. A complete street policy ensures that the entire right-of-way is routinely designed and operated to enable safe access for all users. In keeping with the "complete streets" philosophy, the following outlines some general guidelines or "best practices" for creating "complete streets" and accommodating bicyclists and pedestrians within roadway corridors.



Federal Guidelines

In 2003, FHWA published *Design Guidance Accommodating Bicycle and Pedestrian Travel: A Recommended Approach* (Guidance), a policy statement to guide jurisdiction in integrating bicycling and walking into their transportation systems. The Guidance establishes the following four policies:

1. Bicycle and pedestrian facilities shall be established in new construction and re-construction projects in all urbanized areas unless one or more conditions are met:
    - Bicyclists and pedestrians are prohibited by law from using the roadway;
    - The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use; and
    - Where a sparse population or other factors indicate that there is no need.
2. In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day.

3. Sidewalks, shared use paths, street crossing, pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated, and maintained so that all pedestrians, including people with disabilities, can travel safely and independently.

4. The design and development of the transportation infrastructure shall improve conditions for bicycling and walking through the following additional steps:

    - Planning projects for the long-term;
    - Addressing the need for bicyclists and pedestrians to cross corridors, as well as travel along them;
    - Getting exceptions approved at a senior level; and
    - Designing facilities to the best currently available standards and guidelines.

It should be noted that exemptions to the complete streets requirement calls for exceptional reasons and facilities with Federal funding require FHWA approval of the exemption. A State or local agency could be put on probation for receiving additional Federal funds, if the FHWA finds inappropriate use of exemptions to exclude accommodation of all modes.

Complete Street Design

While the definition of a complete street is universally applicable, the design of complete streets is variable. Each street has unique characteristics that make it distinctive from another. Therefore, a complete street in a rural area will look quite different from a complete street in a highly urban area. However, both streets are designed to balance safety and convenience for everyone using the road.

Elements that may be found on a complete street include: sidewalks, bike lanes, crosswalks, wide shoulder, medians, bus pullouts, special bus lanes, raised crosswalks, audible pedestrian signals, sidewalk bulb-outs, and more. The following outlines the characteristics of “typical” complete streets in an urban and suburban setting.

Multi-Modal Corridors - Complete Streets

Although all streets should be complete streets, there are some streets that should be held to a higher standard and prioritized for improvements. The Multi-Modal Corridors identified in Figure 12: Land Use Concept Plan creates the framework for a multi-modal system and should be targeted for “Complete Street” improvements.

- **SUBURBAN.** Suburban roadways provide unique design challenges to develop complete streets. Suburban streets typically evolved from unimproved rural roads. These changing rural to suburban roadways typically lack sidewalks and bicycle facilities. As development occurs along rural roadways, they need to be improved to suburban street standards that include sidewalks and bicycle lanes and/or paths. Ideally, these suburban roadways should ultimately achieve the City's street standards, the recognition that there already exists a $42.5 million in unfunded roadway improvement backlog, options such as separated sidewalks and paths or shoulders to accommodate the bicyclist should be incorporated in all new roadway improvements.

- **URBAN.** Urban streets are utilized to access mixed-use and commercial areas. These streets typically carry a higher volume of traffic and have more pedestrians and bicyclists present. Transit is an active component of these areas and intermodal connections are prioritized.

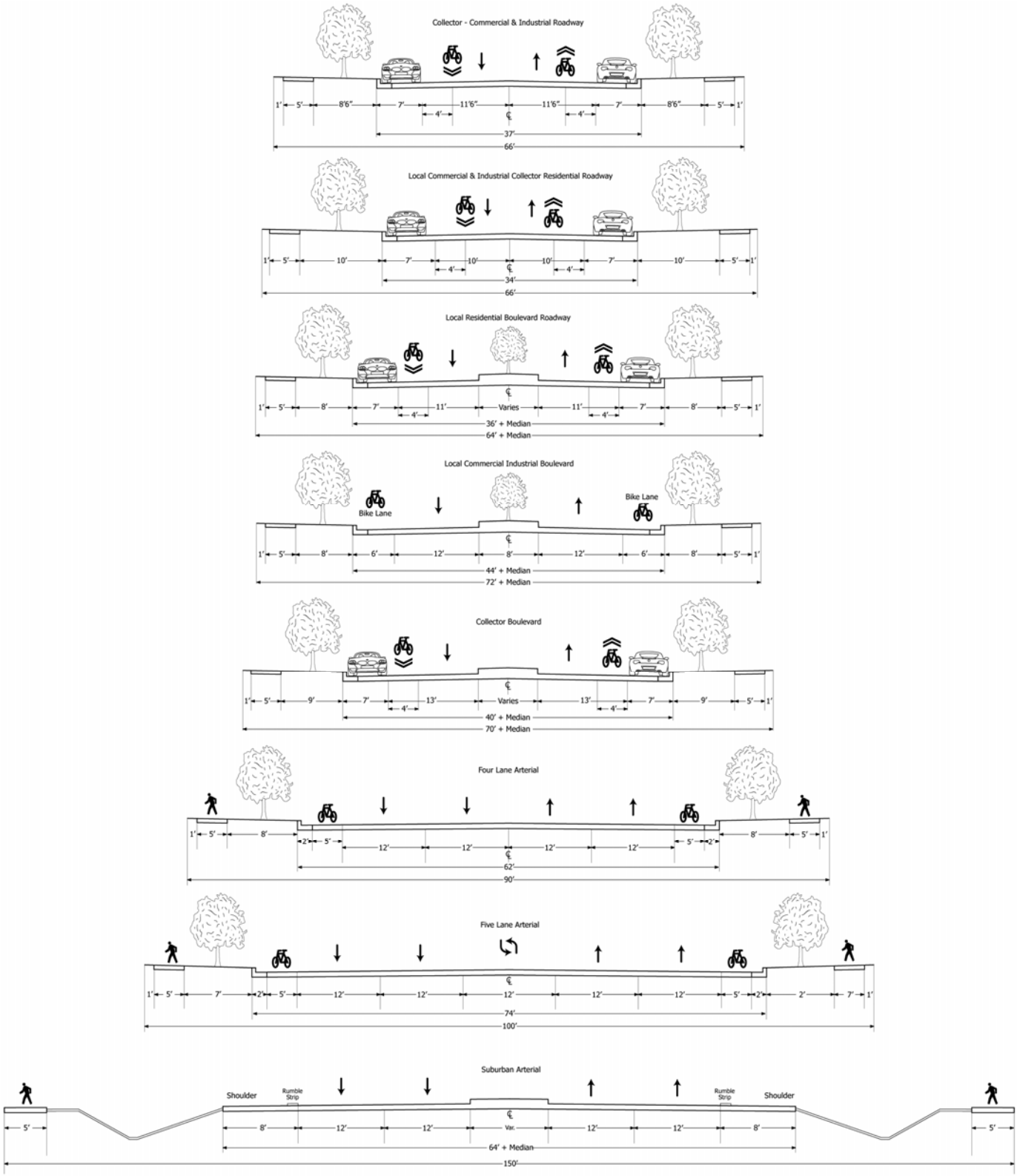
City of Champaign Street Standards

The City of Champaign Street Standards for new development technically provide for a complete street requirements. Often, these standards have been waived and are constructed with "complete street" features such as sidewalks on both sides of the street, bike lanes or tails, or transit stops.

The proposed street standards for new development are presented in Figure 13. These proposed standards are different from the current City's code. Three changes are proposed. First, the current street standard requires 4-foot wide sidewalks for collectors through arterials. It is recommended that the sidewalk standard become five feet as five feet will allow two persons walking together to pass a single person in the opposite direction.

The second recommended change is that instead of an eight foot off street bicycle and pedestrian path for four and five lane arterials, that the proposed standard includes a 5-foot sidewalk and 5-foot bike lane. The total right-of way width remains the same as the current standard. The primary reason for the change is bicycle safety at intersections. With a separated bicycle lane, it has been found through national research that there becomes a conflict when a vehicle makes a right turn and is unaware of a traveling bicycle which is about to cross the street. The bicycle lane has proven safer, even though they are traveling adjacent to the roadway, because they are visible to vehicles desiring to turn left or right at intersecting intersections or driveways.

FIGURE 13: PROPOSED STREET STANDARDS FOR NEW DEVELOPMENT

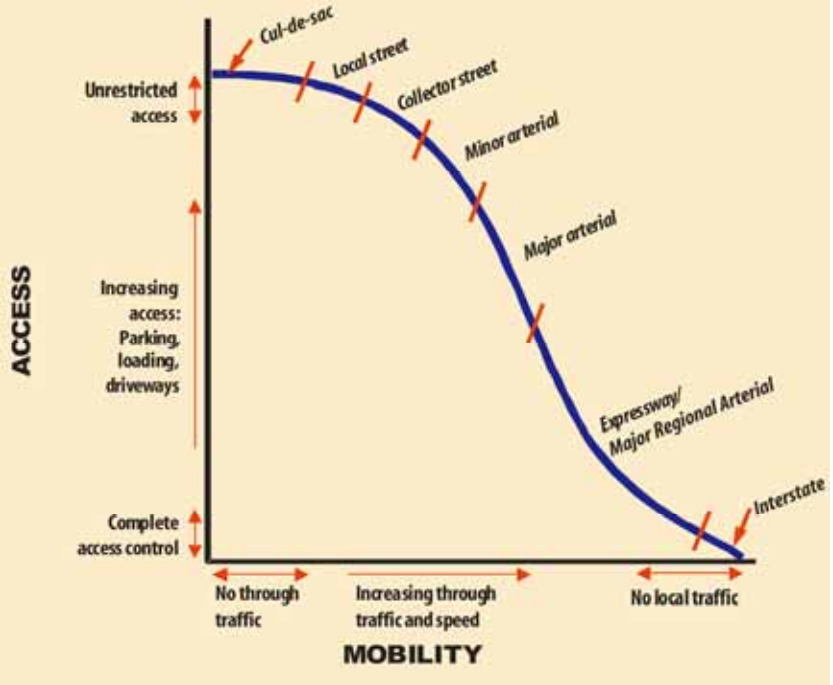


The third change is the addition of a new street classification, the suburban arterial. This classification can be used instead of the four or five lane arterial, primarily targeted in the new growth areas of the city. Instead of bike lane, curb, gutter, parkway and sidewalk, the suburban arterial includes a wide shoulder for the breakdown of vehicles and bicycles. This shoulder is separated by an edge line and a rumble strip. Drainage is accommodated by a borrow ditch. On the far side of the borrow ditch, a five foot sidewalk is provided.

The key to these street standards is to build them as specified, and not waive the improvements. The implementation of a complete streets program that transitions rural roads to suburban and urban multi-modal roadways may require some flexibility with the current street standards. As an example, a rural roadway with new suburban and urban development should include the multi-modal aspects of complete streets, including adequate roadway widths for travel lanes, separated sidewalks or pathways, and some safe bicycle facility such as a bike lane, parallel pathways, or shoulder. Transit opportunities including transit pads and stops and pedestrian linkages should be provided at the time of new development.

As the transitioning area intensifies curb, gutter, landscaped parkway between travel lanes and sidewalks, and street lights should be added to ultimately provide for the complete streets standards specified in the City's current development code.

The implementation of a successful Complete Streets plan requires a systems approach and attention to details. The systems approach is that one can travel from point to point without loss of continuity. This requires coordination between jurisdictions such as the City and the Illinois Department of Transportation, which assures that a bicycle path or side walk is not terminated at key connections such as over or underpasses. Attention to detail for all modes of travel on a complete street should be incorporated as part of a checklist in any public roadway infrastructure design and approval.



ROADWAY VISION PLAN

In the development of Champaign Moving Forward, a careful balance was sought identifying locations of nodes which could support higher density mixed-use retail, commercial, office, and residential development and the connections between neighborhoods and nodes. As a result, the Roadway Vision carefully considered various land use scenarios and the resulting impacts on the transportation system as a result of those scenarios. The 2030 Roadway

Vision is based on the citizen preferred land use scenario of connected neighborhoods and nodes and the multi-modal complete streets that provide the connections.

Roadway Classification

The roadway network is based on a range of different types of facilities with varying characteristics that, when combined, make up the roadway system. These facilities range from highways which serve high-speed, longer-distance trips, to local streets that are designed for lower speeds and shorter trip lengths.

Two important variables which define roadway function are mobility and access. Highways have full access control that allows vehicles to enter and exit only at interchange ramps since mobility is the primary function of a highway. Local streets, on the other hand, have numerous driveways and connections because their primary function is to provide local access to businesses and residences.

In the following discussions of each of the road classifications, the average daily traffic (ADT) for each classification is a general description only. The planned classifications for individual streets are provided on the functional classification map.

Interstates and Highways

The highways in the Champaign area are on the Interstate Highway System. Highways provide for the high-speed movement of large volumes of traffic with a minimum of interference. This is accomplished through the use of access control, divided roadways, and grade-separated interchanges. Highways have the inherent characteristic of lower accident rates because of many built-in safety features such as comfortable alignment, easy grades, speed change lanes, adequate sight distance, and other geometric features that afford a continuous movement of traffic.

Major Arterials

After interstates, arterials are the highest classification of streets. They provide the highest level of mobility at the highest speeds for the longest distances. Access is highly controlled with a limited number of intersections, medians with infrequent openings, and no direct parcel access, depending on use and geographic setting. Existing and future land uses adjacent to principal arterials shall be served by other network roadways, service roads and inter-parcel connections. Principal arterials are designed with traffic volume ranges between 15,000 and 35,000 vehicles ADT.

Minor Arterials

Minor arterials are streets that currently serve higher-speed and higher-volume traffic over medium distances, or are anticipated to serve this kind of traffic within a twenty-five year period. Access is restricted through prescribed distances between intersections and limited direct parcel access. Minor arterials serve major traffic generators and link collector streets with the principal arterials. These streets have a design traffic volume of between 3,500 and 15,000 vehicles ADT. Corridor preservation for future minor arterials including rights-of-way, easements, setbacks, and access limitations shall be pursued through the land development process.

Collectors

The collector street system serves intermediate and short-distance travel. Collectors provide a lower level of mobility than arterials at lower speeds. These streets connect local roads to arterials and have more direct access dependent on use and geographic setting. Traffic volumes on such facilities are lower than those found on arterial facilities. The design volume for these streets ranges from 1,000 to 3,500 ADT. The City's arterial street system typically occurs on a one-mile grid. Collectors should occur at the one-quarter mile to serve local development.

Example of Collector Streets

Local Streets

This is the lowest classification of streets. Local streets provide a high level of access to abutting land but limited mobility. Local streets function primarily to serve local traffic circulation and land access. These streets customarily accommodate shorter trips, has lower traffic volumes, and lower speeds than do collectors and arterials. Streets where design year traffic volume will be between 0 and 1,000 vehicles per day are considered "low volume" local streets. Narrow local streets (lanes) may be used where the volume will be less than 250 ADT.

Transportation Model

The transportation model is a tool to evaluate existing traffic conditions and to help estimate future needs. The model is a modified version of the model developed as part of the Champaign-Urbana Urban Area Transportation Study (CUUATS). It uses existing and forecast data based on the Champaign preferred land use scenario to estimate trips, travel patterns, and travel demand. Model results can be used to identify roadway capacity deficiencies.

The travel model requires data about the population, households, and employment of the region. This socioeconomic data is used to model travel demand and deficiencies. Travel characteristics are modeled for each household and employee based on household size and employment type. The model process uses estimates of household and employment data and the existing roadway network as input assumptions.

The model can produce reasonable results for several roadway network scenarios. The intent is to produce estimates of traffic demand for each roadway segment in the network. These traffic volumes are converted to levels of congestion. In this manner, roadway deficiencies can be identified and potential alternative solutions evaluated.

2030 Roadway Vision Plan

With projected 2030 population and employment growth, roadway deficiencies will continue. The process to develop a 2030 Roadway Vision to accommodate projected 2030 growth included the following steps:

1. **EXISTING + COMMITTED ROADWAY NETWORK:** The existing plus committed roadway network includes both the roadway network that exists today plus those improvements which have committed funding. This roadway network is presented in Figure 14. Committed improvements are highlighted to easily see what has been added.

2. **2030 DEFICIENCIES:** Utilizing the CUUATS regional travel model and the estimated dwelling units, retail employment, and non-retail employment resulting from the Connected Neighborhood and Nodes land use vision plan for 2030, a traffic model was performed to identify where traffic volumes will exceed the existing + committed roadway network capacities. This map also identifies those roadway deficiencies where urban development traffic is occurring on rural roadways. This deficiency map is presented in Figure 15.

FIGURE 14: EXISTING + COMMITTED ROADWAY NETWORK

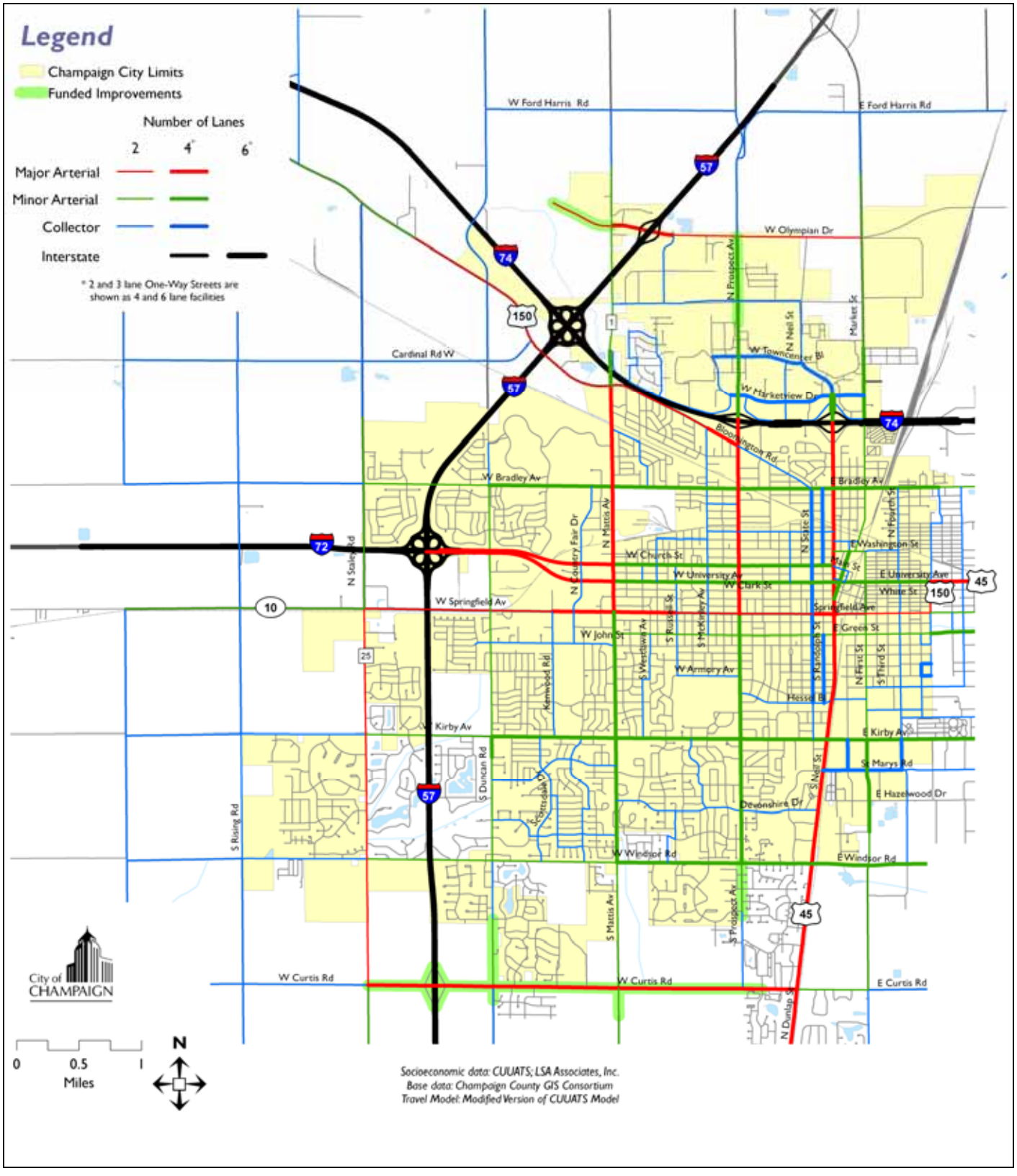
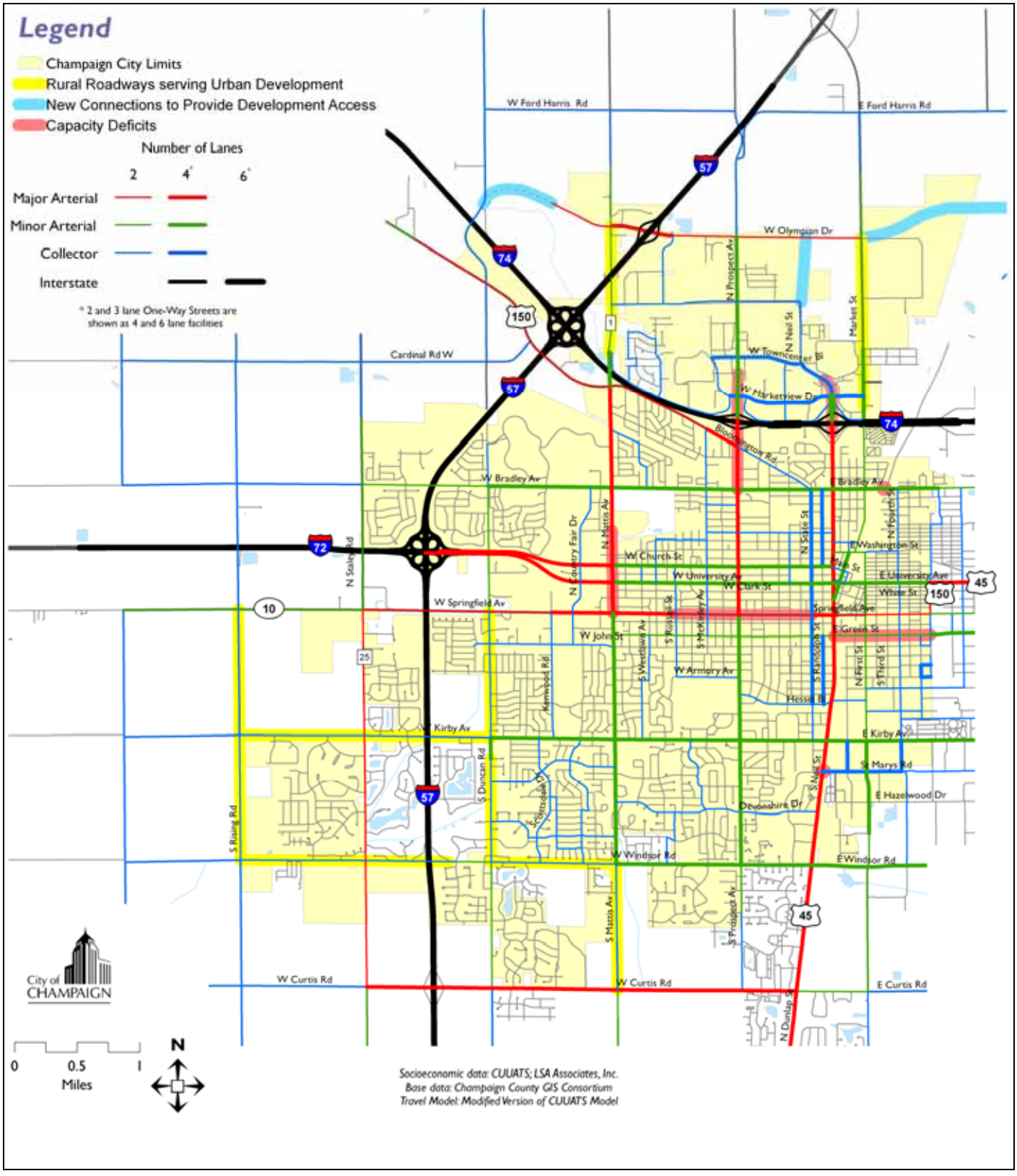


FIGURE 15: 2030 DEFICIENCIES



3. **2030 ROADWAY VISION PLAN:** Based on the 2030 deficiencies analysis, improvements including widening of existing roadways to accommodate future traffic, upgrade of rural roads to accommodate urban development and travel, and new connections to provide access to new developing areas were identified and included in the plan. It should also be noted that this plan does not identify future collectors. As developments occur, it will be necessary to identify a system of collectors, which traverse from arterial to arterial, at the one-quarter mile increment. This collector roadway system is critical to the long term performance of the arterial street system. Similar to the grid system in the older portion of the City, the collector roadways provide internal opportunities for local traffic to travel in all direction to get to an arterial for longer trips, instead of having to first get onto an arterial and adding to the arterial traffic to circulate to a desired direction.

   Figure 16, represents the 2030 Roadway Vision and improvements within Champaign. The map identifies both the functional classification of roadways and the number of proposed lanes. Roadways recommended for change beyond the existing plus committed network are highlighted.

   It should be noted that new collector roads are schematically shown on the map. As development proposals are submitted, refinement of these collector roadways will need to be determined through the development review process including engineering design to determine precise alignments.

   It should also be noted that there have and continue to be areas of congestion or constraint that do not have specific recommendations but will require further study. These include areas such as St. Mary's railroad under crossing, Prospect at I-74, Bradley overpass and the two lane portion of Springfield.

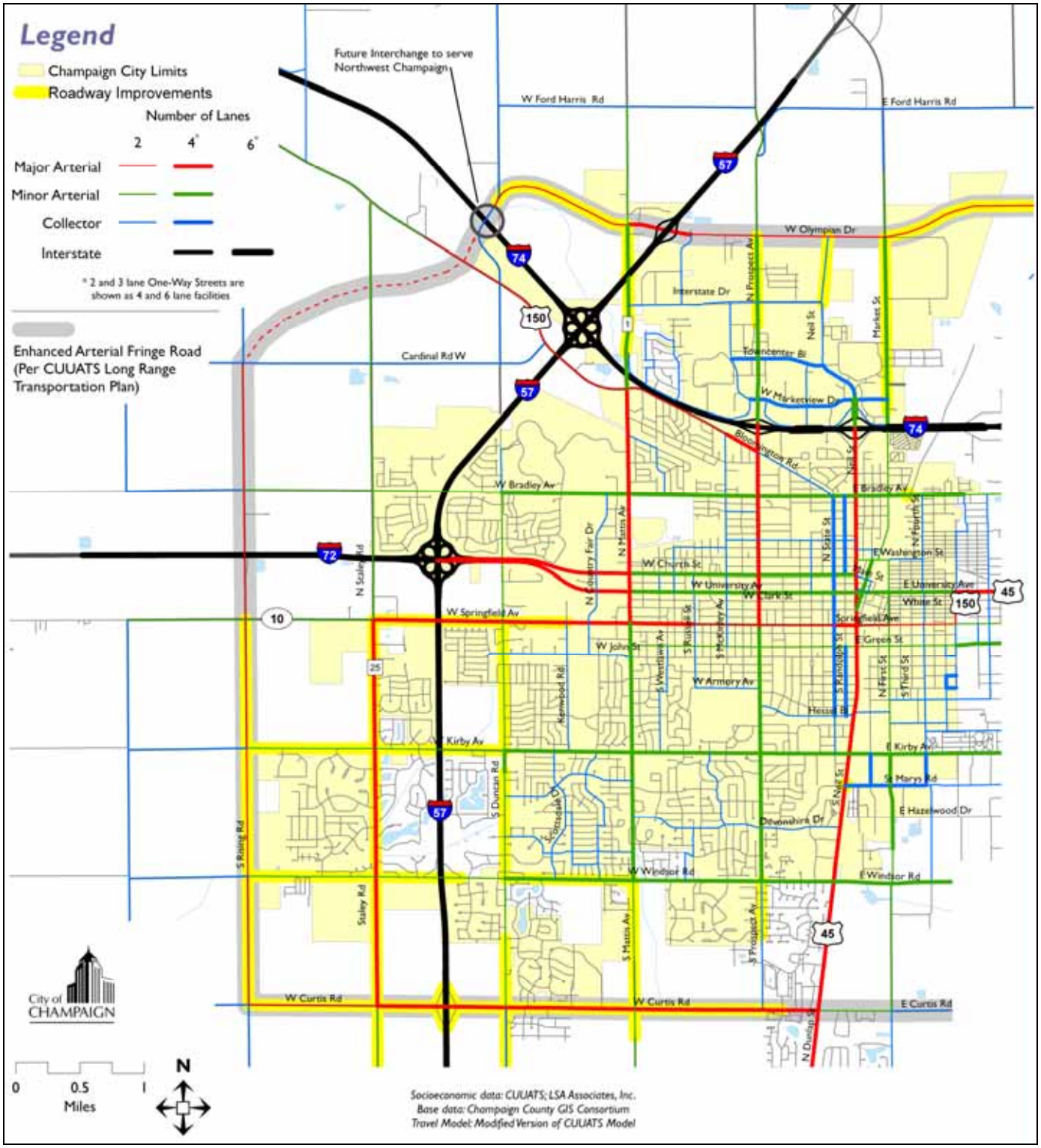
2030 and Corridor Preservation Plan Roadway Improvement Recommendation Process

In general, the process for determining the roadway sizing recommendations for the 2030 Roadway Plan and the Corridor Preservation Plan was based on the travel model deficiencies analysis. If a road or corridor was determined to be deficient based on the forecast traffic volumes compared to the roadway classification, then an increase in the roadway designation was made, which was then rerun in the traffic model to determine if that recommendation corrected for the deficiency.

It should be noted, however, that not all deficiencies resulted in proposed roadway changes. As part of the public involvement process, there was strong desire on behalf of the public to preserve the quality of older neighborhoods and not propose roadway widenings which may improve traffic flow, but impact the neighborhood.

Therefore, portions of streets such as Springfield, Green, and Mattis which were identified as having forecast traffic volumes exceed the capacity of the roadway, there are no roadway widening recommendations proposed. As traffic increases overtime, there will be some additional congestion, while some of the traffic forecasted to utilize these facilities might divert to other routes. These corridors identified as potentially having capacity deficiencies could also be a priority for investment in alternative modes to address the travel demand.

FIGURE 16: 2030 ROADWAY PLAN



Corridor Preservation Plan

Historically, long-range transportation plans have been developed for the 20 to 30-year timeframe. Given the length of time it takes to identify, design, fund, and construct some of the larger improvements, and the uncertainty of the rate and location of growth, the 20 to 30-year timeframe has proven to be too short for comprehensive transportation planning. A concept being included in long-range transportation plans throughout the United States is looking at an extended time horizon longer than 20 to 30 years, and creating a Corridor Preservation Plan. The objective of the Corridor Preservation Plan is to preserve the necessary right-of-way for future roadway improvements, maintain the desired character of the corridor, and fulfill the intended functional classification of each roadway.

These corridors should be preserved and restricted from development and encroachments so that future improvements can be made in an efficient manner. This is done through the active process of:

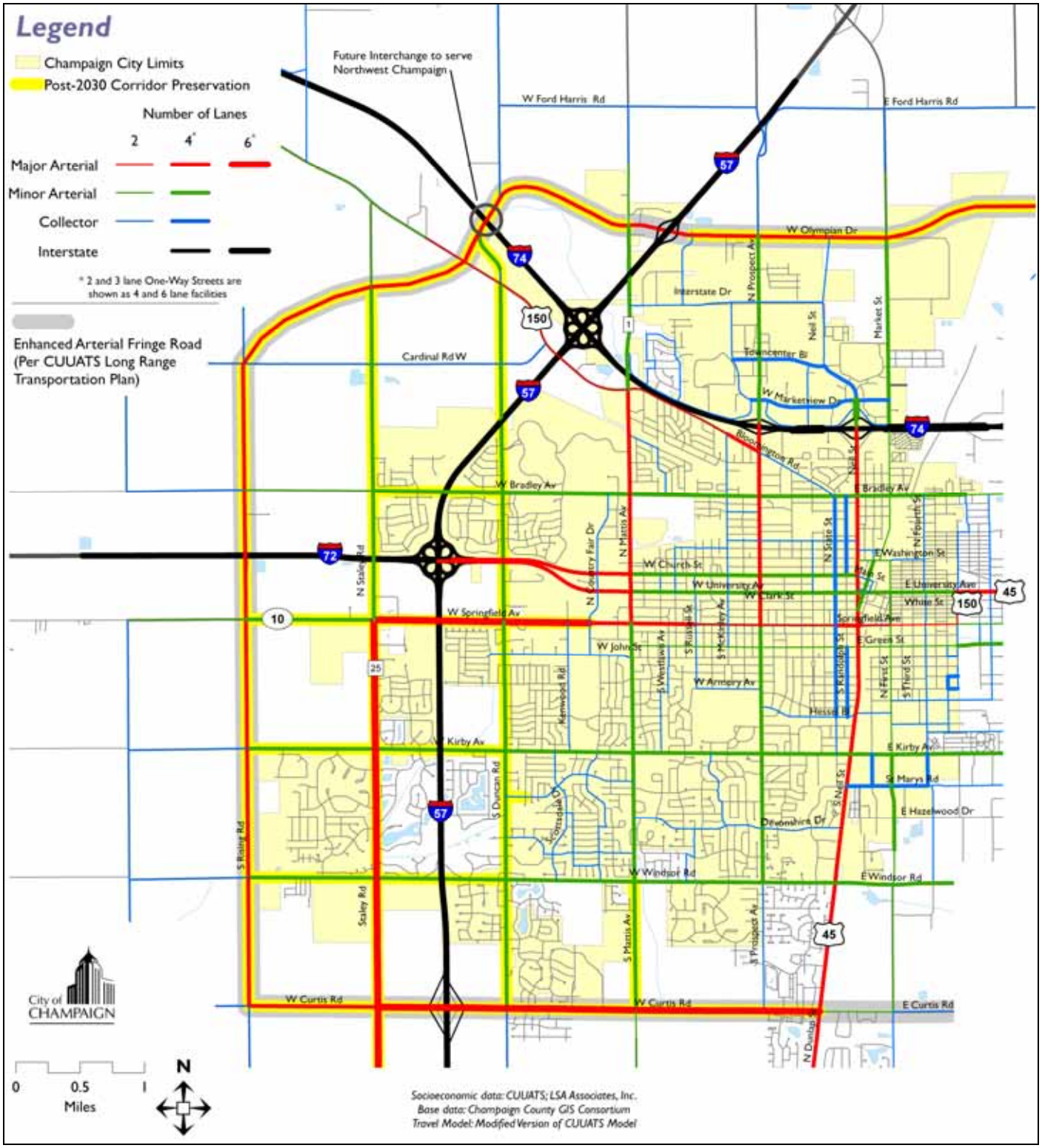
- Identifying major corridors for future roadway improvements;
- Adopting access management requirements for the existing corridors that identify appropriate access point spacing;
- Identifying and securing access management standards for areas beyond the extent of existing urban development; and
- Requiring building and development setbacks that preserve the relationship between the right-of-way and development so that future roadway improvements can be accommodated on the priority corridors.

Complete Street on State Roads

Federal requirements for complete streets are required on all roads including IDOT state roads. Close cooperation with IDOT will be critical to assure that improvements on state highways, particularly at bridge and overpass locations, such as I-57 and Mattis are included in the 2030 Vision Plan. The overpasses and roads are needed to accommodate complete streets multi-modal travel. Current I-57 is a barrier to any crossing except by the automobile.

The Post-2030 Roadway Plan map, shown in Figure 17, presents the recommendation for preserving right-of-way and defines access to accommodate the long-term transportation needs of Champaign. Given the difficulty in identifying what might actually occur in the Post-2030 timeframe the 2030 land use plan assumptions were extended an additional ±20 years beyond the 2030 Plan timeframe. Not all arterial and collector roads are shown on the map and many of the outlying collector roads are shown in approximate locations.

FIGURE 17: CORRIDOR PRESERVATION PLAN



As development proposals are submitted, additional roadways will be determined through the development review process. Furthermore, the future corridor locations are approximate and engineering design will determine precise alignments. This map is intended to indicate where right-of-way should be preserved and where improvement setbacks will be required to provide flexibility in responding to actual development and growth as it occurs. The map does not imply that all of these facilities will be improved to the level indicated. If anticipated developments do not happen, then a given roadway recommendation may not be needed. Conversely, if development is greater than anticipated, then additional facilities may be needed.

Connected Neighborhoods and Nodes: Roadway Improvements

The following provides a list of roadway considerations that should be incorporated into all multi-modal corridors. Although these considerations should be included in all arterial improvements, they are critically important for the multi-modal corridors.

Capacity Improvements

As development occurs, the multi-modal corridors should be widened with curb gutter and sidewalk per the 2030 Roadway Vision Plan and current City of Champaign Street Standards.

Intelligent Transportation System (ITS) Infrastructure

Specific ITS applications that should be considered for the multi-modal transportation corridors include signal upgrades, signal interconnects, and preemption/priority control for transit and emergency vehicles.

Transportation System Management (TSM)

Transportation System Management strategies include access management, intersection improvements, peak period curb-lane parking restrictions, and operational improvements. TSM also includes traffic signal coordination, interstate ramp meters, and incident management (crashes, construction, special events).

Access Management Plan Strategies

Access management is the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway. The purpose of access management is to provide vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system. Although developing a detailed access management plan is beyond the scope of this planning study, it is recommended that a corridor access management plan be developed for each of the multi-modal transportation corridors. The access management plan should be comprehensive so that a consistent approach is applied throughout the corridor. Elements of the access management plan should include:

- Driveway consolidation and establishment of minimum driveway spacing;
- Locating driveways away from intersections;
- Inter parcel access requirements;
- Construction of secondary roadway network and parallel access roads to provide access off of the multi-modal transportation corridor; and
- Integrating access management into other planning activities (such as land use plans, zoning and planning regulations, codes and standards).

Road Maintenance

When providing maintenance and reconstructing existing roadways and bridges, it should be done in a manner that promotes complete streets, safety, increases efficiency, and minimizes lifetime costs. This is especially true for the existing arterial street bridges over Interstates 74 and 57.

Physical Improvements as Part of Corridor Projects

As the Multi-Modal Corridors are improved or constructed, the following guidelines are recommended for consideration:

- Construct improvements to current design standards;
- Improve arterial intersections to serve future volumes (turn lanes);
- Provide acceleration/deceleration lanes in appropriate locations;
- Provide appropriate curb/gutter/sidewalk section on multi-modal corridors;
- Provide appropriate space and/or treatments for on-street bicyclists or separate trail;
- Provide applicable crosswalks markings and devices at locations with pedestrian activity;
- Install traffic signals as warranted; and
- Control arterial access per multi-modal corridor roadway function.

Roadway Policies and Five Year Action Plan

During the course of development of Champaign Moving Forward, several policies were prepared in response to the issues, concerns, and suggestions raised by the public with regard to the roadway system. These policies serve to guide the City's implementation of the roadway component of the TMP. Through these policies and actions, the City will:

Policies

RP-1. Coordinate regional travel issues and plans with, IDOT, CUUATS, Urbana, Champaign County, Savoy, and the University of Illinois.

RP-2. Reduce impacts to the arterial street system by requiring new development to provide internal circulation and connections between developments using collectors.

RP-3. Adhere to Complete Streets roadway standards and requirements and not waive development requirements.

Five Year Action Plan

RA-1. Identify a program where development pays its fair share of roadway improvements based on a nexus between new traffic and impacts.

RA-2. Modify current street standards to Complete Streets which integrates automobile, transit, bicycle, and pedestrian multi-modal facilities.

RA-3. Update codes and standards to require multi-modal transportation assessments for all new proposed developments which address connections, access, and mobility for auto, transit, bicycle, and pedestrian modes.

RA-4. Update parking demand rates, within nodes with both minimum and maximum standards, including requirements for shared parking analysis.