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Strategic Regional Arterial

Design Concept Report

Operation GreenLight

Illinois Department of Transportation
February, 1994

FOREWORD

The Strategic Regional Arterial Design Concept Report has been prepared for the Illinois Department of Transportation and the Strategic Regional Arterial (SRA) Subcommittee of the Work Program Committee of the Chicago Area Transportation Study by Harland Bartholomew & Associates, Inc.

The revised edition of the Strategic Regional Arterial Design Concept Report was endorsed by the Policy Committee of the Chicago Area Transportation Study on March 11, 1993, for use as a guide but not policy in the planning of the SRA system.

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INTRODUCTION

1.1 THE STRATEGIC REGIONAL ARTERIAL SYSTEM

The Strategic Regional Arterial (SRA) system is a 1340 mile network of existing roads in Northeastern Illinois, encompassing 146 route segments in Cook, DuPage, Kane, Lake, McHenry and Will Counties *(See Table 1.1)*. As part of the 2010 Transportation System Development Plan adopted by the Chicago Area Transportation Study and the Northeastern Illinois Planning Commission, the system is intended to supplement the existing and proposed expressway facilities by accommodating a significant portion of long-distance, high-volume automobile and commercial vehicle traffic in the region. Many of the roads in the SRA system, such as Illinois Route 83, Illinois Route 64 and U.S. Highway 41, are already on the arterial highway network of the Illinois Department of Transportation and now carry high volumes of long-distance traffic.

Historically, transportation system plans for Northeastern Illinois have focused on major expressway and fixed rail transit facilities. The 2010 Transportation System Development Plan, by including the SRA system, recognizes the need for a comprehensive network of routes one step below the expressway system to handle long-distance regional traffic. Spacing of routes in the SRA system was determined based upon the projected levels of future travel demand within the different parts of the region, ranging from about three miles apart in the most densely developed areas to about eight miles apart in predominantly rural areas. *Figure 1.1* shows the designated Strategic Regional Arterial system.

Table 1.1
Strategic Regional Arterial Routes

ROUTE	FROM	TO	COUNTY
127th/130th Street	IL 83	Torrence Avenue	Cook
1st Avenue/Cumberland	I-90	I-55	Cook
55th Street	I-55	Morgan Drive	Cook
75th Street	US 34	IL 83	DuPage
87th Street	IL 50	I-94	Cook
Archer Avenue	IL 50	Pershing Road	Cook
Barrington Road	IL 62	US 20	Cook
Bell Road	IL 83	IL 7	Cook, Will
Bloomingdale Road	DuPage-Cook Line	IL 64	DuPage
Charles Road	Lamb Road	IL 120	McHenry
Church Street	US 20	Jefferson Street	DuPage
Columbus Drive	Ontario Street	Lake Shore Drive	Cook
Congress Parkway	Franklin Street	Columbus Drive	Cook
Cornell Drive	Lake Shore Drive	67th Street	Cook
County Farm Road	Army Trail Road	IL 38	DuPage
Dixie Highway/Vincennes	Western Avenue	US 30	Cook
Dunham Road	IL 25	Kirk Road	Kane
Euclid Avenue	Roselle Road	Quinten Road	Cook
Fabyan Parkway	Randall Road	IL 38	DuPage, Kane
Farnsworth Road	IL 56	US 34	Kane
Highland Avenue	IL 56	I-88	DuPage
Hollywood Avenue	US 14 (Ridge)	Lake Shore Drive	Cook

Table 1.1 (Continued)
Strategic Regional Arterial Routes

ROUTE	FROM	TO	COUNTY
Huntley/Algonquin Road	IL 47	IL31	McHenry
IL 1	IL 394	Will-Kankakee Line	Will
IL 7 (159th Street)	IL 53	Will-Cook Line	Will
IL 19 (Irving Park Rd.)	FAP 426	Lake Shore Drive	Cook
IL 21 (Milwaukee Ave.)	IL 120	IL 43	Cook, Lake
IL 22	US 14	US 41	Lake, McHenry
IL 23	US 14	McHenry-DeKalb Line	McHenry
IL 25	IL 62	Dunham Road	Kane
IL 31	US 12	Randall Connector	McHenry
IL 38 (Roosevelt Rd.)	Fabyan Parkway	I-294	DuPage, Cook
IL 43	Lake-Cook Road	US 30	Cook
IL 47	US 14	Kane-Kendall Line	Kane, McHenry
IL 47	Wisconsin Line	Raycraft Road	McHenry
IL 50 (Cicero Ave.)	I-94 (Edens)	I-57	Cook
IL 53	I-80	Wilmington-Peotone Road	Will
IL 56 (Butterfield Rd.)	Kirk Road	Highland Avenue	DuPage, Kane
IL 58	IL 62	McCormick Boulevard	Cook
IL 59	IL 173	I-55	Cook, DuPage, Lake, Will
IL 60	IL 176	US 41	Lake
IL 62	IL 31	IL 58 (Golf Road)	Kane, McHenry, Cook
IL 64 (North Ave.)	Kane-DeKalb Line	LaSalle Drive	DuPage, Kane, Cook
IL 72	Kane-DeKalb Line	US 20	Kane
IL 72 (Higgins Rd.)	IL 25	Touhy Avenue	Cook, Kane
IL 83	Lake-Cook Road	127th Street	Cook, DuPage
IL 120	I-94 (Tri-State)	US 41	Lake
IL 120	Charles Road	US 45	Lake, McHenry
IL 132 (Grand Ave.)	IL 59	I-94	Lake
IL 137	Peterson Road	Sheridan Road	Lake
IL 173	McHenry-Boone Line	Wisconsin Line	Lake, McHenry
IL 176	IL 59	IL 60/83	Lake
IL 176	IL 23	IL 47	McHenry
IL 394 (Calumet Expwy.)	FAP 411 (Calumet)	IL 1	Will, Cook
Illinois/Grand Corridor	Columbus Drive	Lake Shore Drive	Cook
Jefferson Street	Church Road	Army Trail Road	DuPage
Jefferson/Des Plaines Corridor	Roosevelt Road	Ohio/Ontario	Cook
Joliet-Naperville Road	Naper Boulevard	Weber Road	Will
Kirk Road	Dunham Road	IL 56	Kane
Lake Shore Drive	Hollywood Avenue	Cornell Drive	Cook
Lake-Cook Road	US 12 (Rand Rd.)	US 41	Cook
Lamb Road	Charles Road	US 14	McHenry
Larkin Avenue	Weber Road	I-80	Will
LaSalle Drive	Wacker Drive	Lake Shore Drive	Cook
McCormick Boulevard	Dempster Street	US 41	Cook
Michigan Avenue	Lake Shore Drive	Roosevelt Road	Cook
Midway Plaisance	Morgan Drive	Cornell Drive	Cook

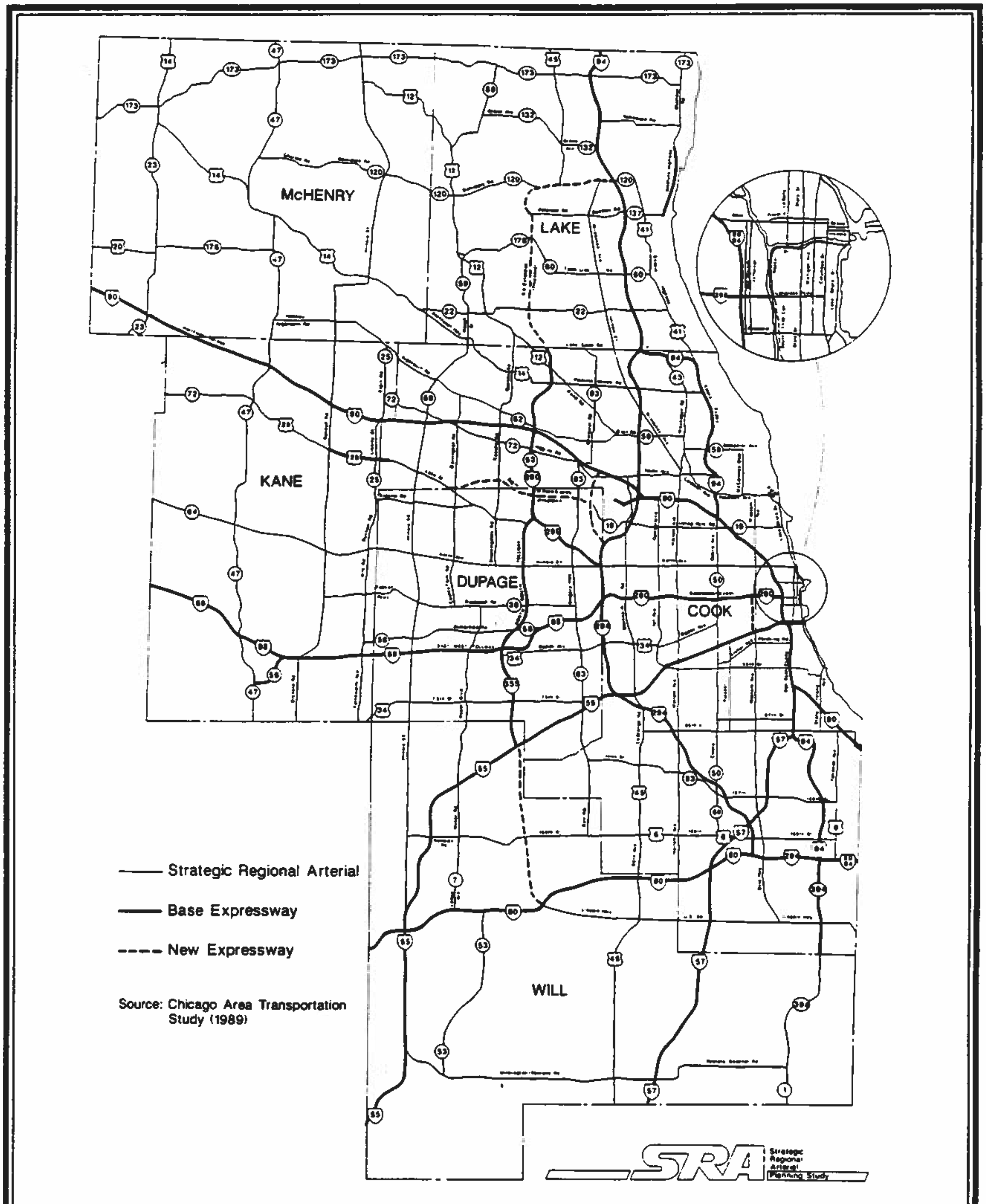


Figure 1.1 The Strategic Regional Arterial System

Table 1.1 (Continued)
Strategic Regional Arterial Routes

ROUTE	FROM	TO	COUNTY
Morgan Drive	55th Street	Midway Plaisance	Cook
Naper Boulevard	US 34	Joliet-Naperville Road	DuPage, Will
Naperville Road	IL 38	US 34	DuPage
Ohio/Ontario Corridor	I-90/94	Columbus Drive	Cook
Orchard Road	Randall Road	US 30	Kane
Palatine/Willow Road	US 14	I-94	Cook
Peotone Road	I-55	IL 1	Will
Pershing Road	Archer Avenue	I-90/94	Cook
Peterson Road	FAP 432	IL 137	Lake
Pulaski Road	I-55	US 12/20	Cook
Quinten Road	Euclid Avenue	US 12	Cook, Lake
Randall Connector	Randall Road	IL 31	McHenry
Randall Road	Randall Connector	Orchard Road	Kane, McHenry
Raycraft Road	IL 47	Charles Road	McHenry
Renwick Road	IL 59	IL 7	Will
Roosevelt Road	Lake Shore Drive	I-90/94	Cook
Roselle Road	Euclid Avenue	Cook-DuPage Line	Cook
Sheridan Road	IL 173	Amstuts Highway	Lake
South Loop Connector	Congress Parkway	Cermak Road	Cook
Stearns Road	Dunham Road	US 20	DuPage, Kane
Stony Island Avenue	67th Street	I-94	Cook
Torrence Avenue	US 12/20	I-80/94	Cook
Touhy Avenue	IL 72	I-94	Cook
US 6	Cook-Will Line	Torrence Avenue	Cook
US 12	Wisconsin Line	IL 58 (Golf Road)	McHenry, Cook, Lake
US 12/20	US 45	Cook-Indiana Line	Cook
US 14	IL 43	Hollywood Avenue	Cook
US 14	Wisconsin Line	Palatine Road	McHenry, Cook, Lake
US 20	IL 72	I-355	DuPage, Kane
US 20	McHenry-Boone Line	IL 23	McHenry
US 30 (Lincoln Hwy.)	I-80	Cook-Indiana Line	Cook, Will
US 30 (Lincoln Hwy.)	IL 47	US 34	Kane
US 34	US 30	75th Street	DuPage, Kane
US 34	I-355	IL 50	DuPage, Cook
US 41	McCormick Boulevard	Peterson Road	Cook
US 41	IL 120	Lake-Cook Road	Lake
US 45	Wisconsin Line	IL 120	Lake
US 45	Touhy Avenue	Will-Kankakee Line	Cook, Will
Wacker Drive	Lake Shore Drive	Congress Parkway	Cook
Weber Road	Joliet-Naperville Road	Larkin Avenue	Will
Western Avenue	US 14 (Peterson)	Dixie Highway	Cook
Yorkhouse Road	I-94 (Tri-State)	Sheridan Road	Lake

NOTE: All the existing, committed, and proposed expressways are considered along with the strategic regional arterials as the overall system to serve regional traffic.

1.2 PURPOSE OF THE REPORT

Routes on the SRA system have widely varying characteristics. Existing rights-of-way, roadway features, land use and access differ from route to route, and also may change from one segment of a route to another. The purpose of this report is to identify design features and levels of improvement which are appropriate for the different types of routes and roadway environments in the system -- urban, suburban and rural -- to create a total network capable of handling the high-volume, long distance traffic for which the SRA system was designated. The report will also serve as a comprehensive reference document for planning of short-term and long-term improvements to SRA routes. It provides specific recommended design criteria, which are intended to be applied throughout the system, for each route type. Specific roadway design criteria is identified for each route type to promote safe roadway operations throughout the SRA network. Since a variety of special circumstances could be encountered on the various SRA routes, the report also identifies design features and techniques tailored to particular situations and conditions along these routes. Finally, the report identifies general policy and program recommendations to be considered as the SRA system is implemented.

1.3 ORGANIZATION OF THE REPORT

The SRA Design Concept Report is divided into four major sections:

Section 1: General

Chapters 1-3 provide an introduction to the purpose and use of the report, the SRA system and its relationship to Operation Green Light, and the SRA planning process and implementation.

Section 2: Recommended Designs and Features

Section 2 presents the application of recommended designs and features as criteria for planning the SRA routes. ***Chapters 4-6*** each deal with one of the three SRA route types -- urban, suburban and rural -- in terms of recommended design criteria for right-of-way, roadway, intersections and other route components. Recommended cross-sections, typical environmental considerations, and an example of a typical application of the design criteria are also provided in these chapters for each route type.

Section 3: Techniques for Special Circumstances

Section 3 describes the use of techniques for special circumstances. ***Chapters 7-9*** identify design features and techniques which can be applied in special circumstances for each of the three SRA route types to be used in situations where recommended design features are not appropriate.

Section 4: Policy Issues

Chapter 10 identifies general policy and program recommendations concerning right-of-way issues; access policies; extra-jurisdictional project participation; traffic management; roadway maintenance; enforcement of parking and loading regulations; and demand management. These recommendations are suggested for consideration by agencies responsible for SRA routes as the system is implemented.

1.4 PREPARATION OF THE REPORT

This report was prepared by an interdisciplinary team of planning and design professionals working in collaboration with project representatives of the Illinois Department of Transportation (IDOT) and the Chicago Area Transportation Study (CATS). An extensive review process involving the CATS SRA Subcommittee and Task Forces, as well as IDOT and CATS staff contributed to the development and refinement of this report.

CHAPTER 2
THE SRA SYSTEM AND OPERATION GREEN LIGHT

2.1 OPERATION GREEN LIGHT

According to forecasts prepared by the Chicago Area Transportation Study, travel in the year 2010 in Northeastern Illinois is expected to increase by 23 percent over 1980 levels. In the last few years, rapid economic development and growing population have resulted in significant increases in congestion on the region's expressways, and on arterial and local roads in many parts of the region as well. Creation of the SRA system is a major component of Operation Green Light, an eight-point plan to deal with urban congestion and improve regional mobility developed by the Illinois Department of Transportation in cooperation with the Illinois State Toll Highway Authority, the Chicago Area Transportation Study, the Northeastern Illinois Planning Commission and the Regional Transportation Authority. In addition to creating the SRA network, Operation Green Light addresses the following major transportation issues:

- **Developing Major Transit/Highway Facilities**
- **Improving Other Key Arterial Roadways**
- **Identifying Strategic Transit Improvements**
- **Improving Freeway Traffic Management**
- **Improving Arterial Traffic Management**
- **Reducing Demand for Highway Use**
- **Increasing Environmental Consideration.**

Together, the components of Operation Green Light are a blueprint for a comprehensive approach to improve transportation in Northeastern Illinois. As part of this comprehensive approach, the SRA system is designed to **(1)** improve regional mobility by providing a comprehensive network of arterial routes designed to carry significant volumes of long-distance traffic across the region, **(2)** complement the region's major transit and highway facilities by providing access for regional trips on these facilities, and **(3)** provide for long-distance travel to supplement the regional expressway system.

2.2 OBJECTIVE FOR THE SRA SYSTEM

The SRA system is intended to accomplish certain specific objectives within the overall regional transportation system:

Supplement an expanded expressway system by:

- Improving access to expressways
- Providing alternatives for some portions of expressway travel
- Providing a lower-cost substitute for expressways in some corridors

Enhance public transportation and personal mobility by:

- Improving access to rail transit station
- Improving operating conditions for buses and other transit vehicles
- Identifying opportunities for future transit facilities
- Maintaining pedestrian and bicycle accessibility

Accommodate commercial vehicle traffic by:

- Improving structural clearances
- Maximizing through-traffic movement.

2.3 THE SRA SYSTEM AND REGIONAL MOBILITY

Although significant improvements to the overall regional transportation system have been made in recent years, forecasted growth in the Chicago area will create more traffic than the existing system can handle. Forecasts of 2010 socioeconomic factors prepared by the Northeastern Illinois Planning Commission (NIPC) show regional growth in population (15%), households (29%) and employment (23%) over the 1980 to 2010 time period. This growth represents the addition of over one million new residents, almost three-quarters of a million households and over three-quarters of a million new jobs.

Within these overall regional totals are changes in the spatial pattern of activity, which have implications for transportation. Three-quarters of the population growth is expected to occur outside Cook County. Household size will continue to decline, reaching 1.5 persons in 2010. Employment will increase across the region with the largest absolute gains in the city of Chicago, suburban Cook County and DuPage County. Employment in the Chicago central area is projected to increase to 890,000 in 2010, representing 21 percent of the regional employment, compared to 19 percent in 1980.

While the SRA system is a major element of the regional effort over the next 20 years to address problems of urban and suburban congestion, the development of the SRA system alone is not intended to solve the congestion problem in the Chicago area. Implementation of other components of Operation Green Light as well as ongoing programs of the Operation Green Light Task Forces, CATS and NIPC are integral parts of the comprehensive approach to improving regional mobility. These programs address several related issue which are not specifically part of this SRA planning process, but which have important implications for the SRA system. These issues are:

Arterial Traffic Management. Improved traffic management techniques offer cost-effective methods to improve traffic flow and enhance capacity on the SRA routes. Development of a regionwide incident detection network and creation of an overall congestion monitoring system on the SRA System are possible methods. With current technology, using detectors in the pavement, a monitoring system could identify congestion based upon speeds and occupancy, as is now done on the freeway surveillance system. Extension to the SRA system of the present system of motorists reporting incidents from car phones could also be accomplished. As more advanced driver information systems are developed, they could also be used on the SRA system.

Demand Management. In addition to improving capacity of the overall transportation system, Operation Green Light considers reducing demand for highway use to be essential for improving regional mobility. Strategies to promote alternative work schedules, ridesharing programs, parking incentives/

disincentives, improved transit service, and employer transit subsidies are possible components of a Transportation Demand Management (TDM) Program. A TDM program may be implemented under two different approaches.

Through implementing legislation which sets mandated goals, performance standard and administrative procedures; or,

On a voluntary basis, often through the formation of a Transportation Management Association (TMA).

In the Chicago area, the legislative approach has been used only by a few local jurisdictions as a condition of approval for specific developments, but may be applicable elsewhere on a similar basis. The voluntary approach, with a TMA as a public-private partnership, has been established in several locations in the Chicago area. The TMA approach offers opportunities to coordinate TDM programs for individual route corridors or larger segments of the SRA system.

Coordination with Local Land Use Plans. Northeastern Illinois is composed of literally hundreds of jurisdictions. For the SRA system to successfully accomplish its objectives, coordinated planning with each of the jurisdictions is necessary along each of the routes. Local planning and development policies, particularly the arrangement of land uses adjacent to the arterial street and type of access, will greatly affect the ability of the facility to fulfill its function of carrying long-distance traffic. Right-of-way protection also should be coordinated with local planning and development. Land use planning techniques can also encourage use of alternate modes of transportation, with policies favorable to mixed use development.

Projected travel demand used in planning the SRA system reflects population, household and employment forecasts and local plans. Compatibility of future growth with these forecasts and plans is important to protect investment in the SRA system; by creating higher demand than the system is designed to carry, incompatible development results in lower levels of service and increased congestion. Local planning should also provide for an adequate system of local arterials and collectors, so that SRA capacity to serve regional trips is maintained.

Because SRA routes create a regional network, the impact of planning and development decisions crosses local boundaries. The need for cooperation among local governments and regional transportation agencies in coordinating land development with planned SRA improvements is important whether or not a formal framework is established. The Illinois Land Resources Management Act may provide a technique for communities to jointly plan development along an SRA route. Although relatively new, the Act has been proposed as the basis for an intergovernmental agreement among 17 municipalities participating in the Corridor Planning Council of Central Lake County.

Dedication or reservation of right-of-way on the SRA routes through the local development process is an effective means of protecting needed right-of-way to provide for future roadway improvements. Adoption of the Official Map and/or Official Plan as authorized by State Statute for municipalities and counties and would allow desirable right-of-way widths for SRA routes to be included as standards for subdivision approval.

CHAPTER 3
PLANNING THE SRA SYSTEM

3.1 SRA PLANNING OBJECTIVES

Development of comprehensive, long-range plans for the entire SRA network is necessary in order to implement the SRA system. These plans will identify both short-range and long-range improvements for each of the SRA routes. The following objectives should guide the planning process:

- **Determine the types of roadway improvements needed for each route including additional lanes, signalization and interchanges.**
- **Examine ways to enhance public transportation.**
- **Identify and protect needed rights-of-way.**
- **Manage access to SRA routes to improve through traffic movement and reduce conflicts.**
- **Coordinate land use and development projects with transportation improvements.**
- **Identify ways to accommodate the growth in commercial traffic.**
- **Accommodate necessary bicycle and pedestrian travel on the SRA route corridors.**
- **Identify potential environmental concerns.**

The plans are intended to be specific to each SRA route as designated in the 2010 Transportation System Development Plan. However, this does not preclude consideration during the planning process of alternative segments on a route where warranted by circumstances. Also, the planning process addresses the fact that not all transportation needs can be provided within the right-of-way of an SRA route, and that some types of travel may be better provided on parallel facilities.

3.2 SRA ROUTE TYPES

Within the overall SRA network, there are significant differences in the roadway environment, which determine how different types of routes may function in the system. Three different types of SRA routes have been designated, corresponding to three different types of roadway environments:

- **Urban Routes**
- **Suburban Routes**
- **Rural Routes**

SRA routes located in densely urbanized areas typically are existing routes with minimal possibilities for roadway expansion, where improvements could be made to intersections, local transit facilities and low structural clearances. For routes in developing suburban areas, preservation of right-of-way, additional lanes on roadways, new connections to improve route continuity, and operational improvements such as signal coordination may be considered. In rural areas, preservation of right-of-way and controlled access would provide for movement of through traffic and accommodate future needs.

The designation of route types within the overall SRA system reflects the density of development within the different portions of the region. The projected density of households for the year 2010 was used as the criterion for defining density of development for the route types. The densities which correspond to each of these route types are:

- **Urban routes:** Densities over 5.0 households per acre by 2010.
- **Suburban routes:** Densities between 0.5 and 5.0 households per acre by 2010.
- **Rural routes:** Densities less than 0.5 households per acre 2010.

The areas for each route type are shown in *Figure 3.1*. Urban routes are located in the City of Chicago and adjacent portions of more densely developed suburbs such as Oak Park. Suburban route designations encompass most of suburban Cook and Lake Counties, all of DuPage County, and the more developed portions of McHenry, Kane and Will Counties. Rural routes are located in the outer portions of Lake, McHenry, Kane and Will Counties. Within each of the three areas, continuity of route type is maintained based upon the overall density of 2010 development.

The following are examples of each route type:

Urban Routes
- Michigan Avenue
- 55th Street
- Western Avenue

Suburban Routes
- Palatine/Willow Road
- Butterfield Road
- Illinois Route 59

Rural Routes
- Illinois Route 173
- Peotone-Beecher Road
- Illinois Route 47

Each of the three route types has different characteristics of the existing roadway environment which affect the type and scope of potential future improvements. Typical existing characteristics for each route type – urban, suburban and rural – are shown in *Table 3.1*. Where existing characteristics on a particular route segment differ markedly from the typical situation, such as in a suburban central business district, consideration of special techniques may be required in the route planning process.

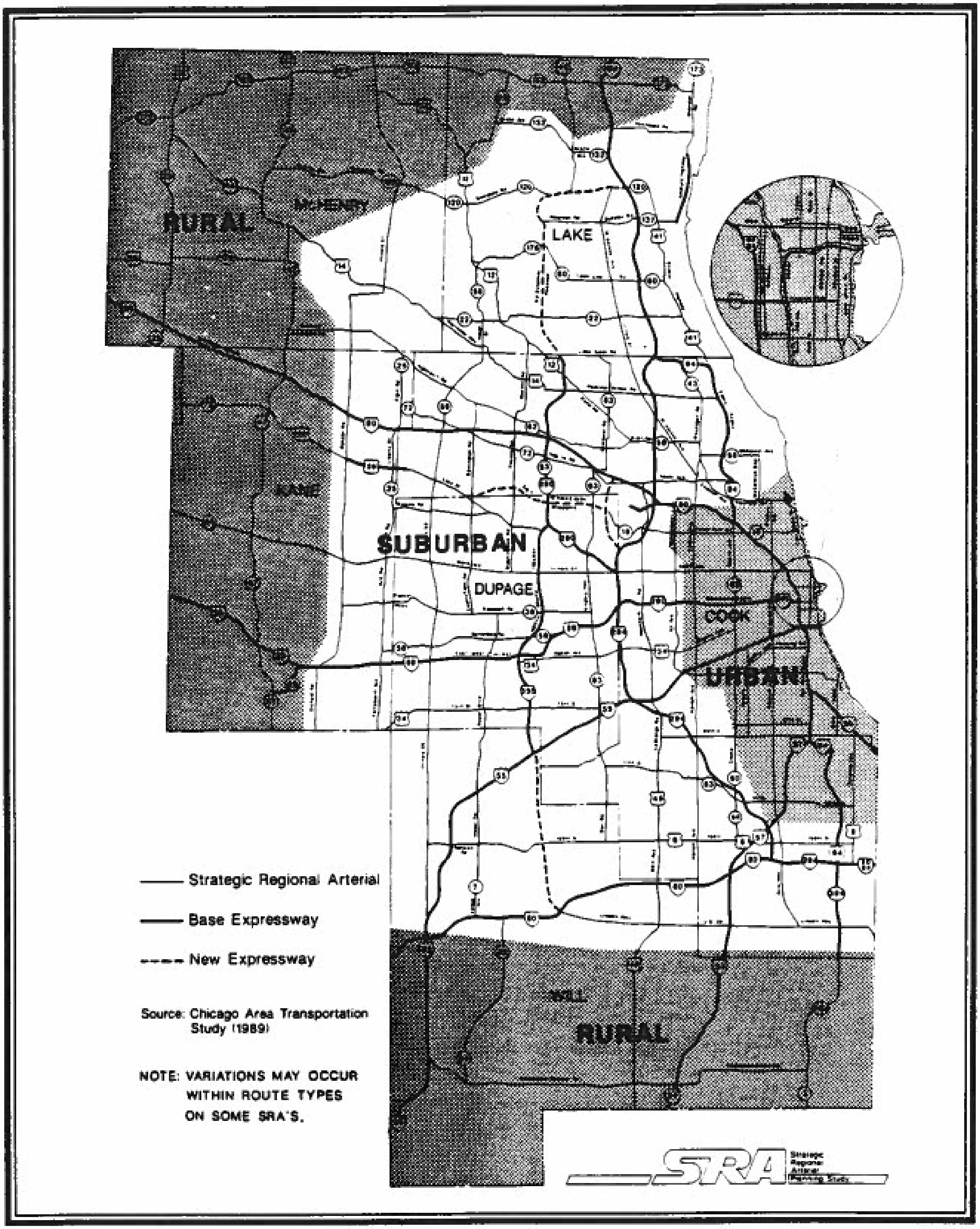


Figure 3.1 Route Types on the Strategic Regional Arterial System

Table 3.1
Typical Existing Route Conditions

URBAN ROUTE	SUBURBAN ROUTE	RURAL ROUTE
Right-of-Way		
• 60-100 Feet	• 100 Feet	• 100 Feet or more
Developed Roadway		
• 4-6 Lanes 10-12' each • Total Width 44-80 feet • Curb & Gutters • No Shoulders • Cross Streets 8-20 per mile • Occasional Center lane or Left-turn lane • On-street parking & loading • Limited Off-street parking • Few Right-turn lanes • Traffic Signals 4-8 per mile • Continuous Sidewalk	• 4 Lanes 12' each • Total Width 66-100 feet • Shoulders 0-10 feet, sometimes paved • Cross Streets 2-10 per mile • Continuous No Median, Center lane, or Median with turn bays • Curb cut(s) for each owner • No Parking loading, off-street required • Traffic Signals 1-5 per mile • Discontinuous Sidewalk • Curbs, gutters common • Some Right-turn lanes	• 2-4 Lanes 12-14' each • Total Width < 60 feet • Shoulders 2-6 feet • Cross Streets ≤1/mile • Few Medians or turn bays • Unrestricted Curb Cuts • No Parking, loading • Traffic signals ±1-2 mile apart • No Sidewalk, Curbs • Some Right-turn lanes
Surrounding Uses		
• No Setback or limited setback • Residential, Commercial, Industrial, Recreational • Building/Land Ratio: >1.5/1.0	• 20-35' Building Setback • Residential, Commercial, Industrial, Recreational • Building/Land Ratio: 0.2-1.0/1.0	• Large Setback • Agricultural, Residential, Recreational • Building/Land Ratio: <0.01/1.0
Posted Speed		
• 25-35 mph	• 35-50 mph	• 55 mph
Users		
• 25,000-65,000 Vehicles per Day • 8-10% Peak Hour Volume • 55/45 Directional Split • Local Freight • High Transit Volume • Bicycle Usage • High Pedestrian Volume	• 15,000-55,000 Vehicles per Day • 8-10% Peak Hour Volume • 55/45 Directional Split • Through & Local Freight • Variable Transit Intensity • Bicycle Usage • Variable Pedestrian Volume	• 5,000-15,000 Vehicles per Day • 8-10% Peak Hour Volume • 55/45 Directional Split • Through Freight • Farm Vehicles • No Significant Local Freight or Transit

3.3 THE SRA PLANNING AND IMPLEMENTATION PROCESS

The SRA planning process has two parts:

The first part consists of developing **Recommended Design Features and Techniques** for each of the three SRA route types. This report documents the results of the first part to be used in developing the route-specific plans.

The second part consists of preparing specific **Route Studies** for each SRA route. The plans will recommend comprehensive short-range and long-range improvements for each route, through the work program (See *Figure 3.2* .).

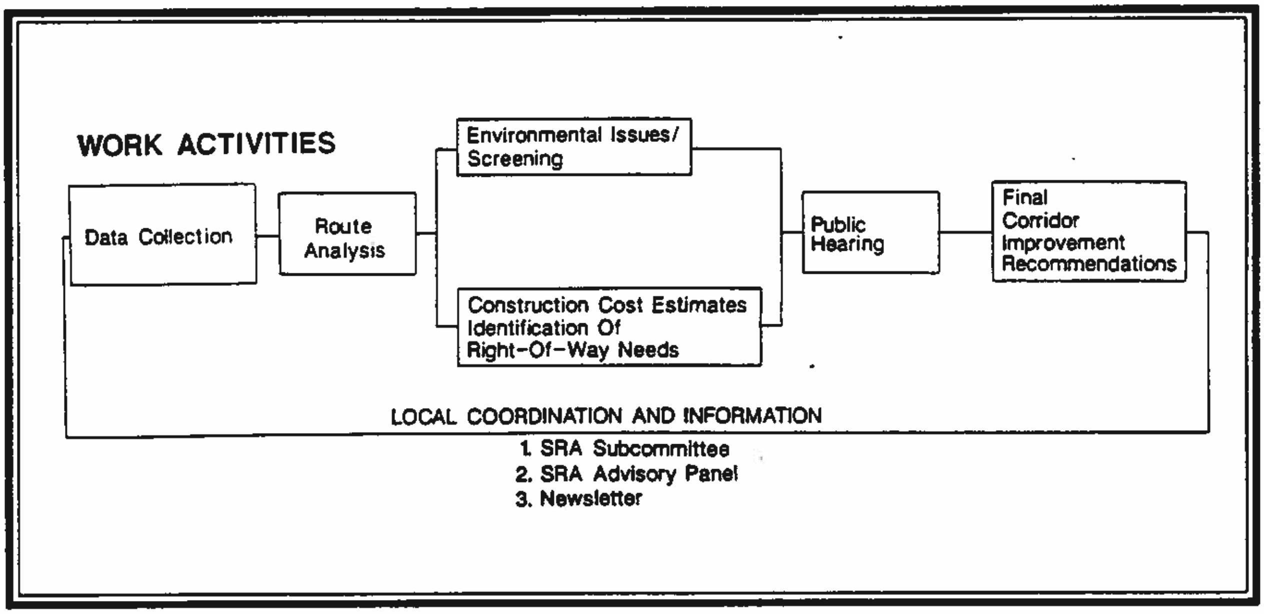


Figure 3.2 The SRA Route Studies Work Program

The principal activities in the **Route Studies** work program are summarized below.

Data Collection/Evaluation. The SRA planning process is designed to efficiently use available data. For each route, data is assembled from right-of-way information, roadway plans, traffic volume projections, transit information, bicycle usage, adjacent development characteristics, accident data, environmental studies and other sources, and is analyzed to establish current conditions, constraints and improvement needs.

Route Analysis. Possible improvements for the SRA route are determined by incorporating the recommended design features in specific configurations for each segment of the overall route. These configurations will include alternative designs and techniques where necessary to accommodate local conditions or constraints. The timing of the recommended improvements, whether long-range or short-range, will also be identified.

Environmental Issues/Screening. While the SRA planning process does not include detailed environmental assessments or analysis of specific mitigation measures, a screening process will identify significant environmental conditions along each route. The results of this process will be used to evaluate improvement alternatives, and will also serve as an early indicate of environmental issues for future design studies.

Construction Cost Estimates/Identification of Right-of-Way Needs. Construction cost estimates for each route segment will be prepared, both for short-range and long-range improvements. Right-of-way needs to accommodate recommended long-range improvements will also be identified.

Local Involvement and Coordination. Throughout the SRA route planning process, the involvement of local and regional agencies is an important consideration. Information and coordination efforts include forming Advisory Panels for each SRA route, which will work with IDOT during the planning process. A regular newsletter for each Panel will inform members about the SRA program and ongoing route studies. A public hearing in an open house format will also be conducted for each route.

Final Route Improvement Plan/Report. As the final step in the planning process, a report for each SRA route will document the recommended improvements and findings.

The second part of the SRA planning process is to be accomplished over the next five years, with approximately 20 percent of the total system included in each year. Together, the route-specific studies will result in a comprehensive plan for the entire network. As planning for each route is completed, the plans will be used to help program the scope and timing for improvements along that route. For State routes, once an SRA improvement is included in the IDOT Five-Year Program, the process of implementation follows the process shown in *Figure 3.3*. For SRAs which are not State routes, a similar process could be followed under county or municipal jurisdiction. The SRA studies are the Pre-Phase I stage.

PRE-PHASE I (SRA ROUTE STUDIES)	PHASE I/ DESIGN REPORT	PHASE II	PHASE III	PHASE IV
PLANNING	PRELIMINARY DESIGN	FINAL DESIGN	CONSTRUCTION	POST CONSTRUCTION
1. Data Collection 2. Test Alternatives 3. Local Coordination 4. Environmental Screening 5. Recommend Improvements 6. Public Hearing	1. Preparation of Preliminary Plans 2. Public Involvement 3. Environmental Studies/Mitigation 4. Public Hearing	1. Preparation of Contract Plans 2. Community Coordination 3. Environmental Mitigation	1. Implementation 2. Community Coordination	1. Environmental Monitoring 2. Land Development/ Access

Figure 3.3 The SRA Implementation Process for Routes Under IDOT Jurisdiction

3.4 BICYCLE ACCOMMODATION ON SRAS

Since the SRA system is generally intended to accommodate a significant portion of long-distance, high-volume automobile and commercial vehicle traffic, SRAs will not be conducive to recreational bicycling and travel by the novice or inexperienced cyclist. Therefore the system will not be considered as part of a bicycle network with special accommodations for novice and inexperienced cyclists. However, bicycle usage is typical on urban and suburban SRA routes, as noted in *Table 3.1* of this report. This is primarily due to the number of destinations on the SRA segments which are accessible only by travelling on the SRA. Cyclists of average or greater skill level, i.e. those comfortable riding in traffic, will use the SRAs to reach these destinations, with or without the presence of a designated space for bicyclists. They are interested in direct, convenient routes for their utilitarian travel. The recommendations contained within this report for the accommodation of bicycles on SRAs focuses on the safe accommodation of utilitarian trips to be made by cyclists of average or greater skill level. The recommendations are compatible with AASHTO's 1991 Guide for the Development of Bicycle Facilities adopted by IDOT.

3.5 HOW TO USE THE REPORT

This report provides recommended design standards and criteria to be used in developing route-specific plans for the SRA system. Each section of the report provides guidance in a specific area for SRA planning:

SECTION ONE: Identifying the Appropriate Route Types

The type of route determines the appropriate design standards and techniques. Section 3.2 in this chapter identifies three types of SRA routes – urban, suburban and rural. *Figure 3.1* in this chapter is a map of the total SRA system with specific areas marked for each of the three types. From this map the type of route can be determined. For example, Pulaski Road is classified as an urban route; Illinois Route 60 (Town Line Road) is classified as a suburban route; and Peotone-Beecher Road is classified as a rural route. Some longer routes may involve more than one route type. Illinois Route 64 (North Avenue), for example, has urban, suburban and rural segments.

SECTION TWO: Determining Recommended Designs and Features

Recommended Designs and Features are given for each type of route:

- **Urban Routes in Chapter 4**
- **Suburban Routes in Chapter 5**
- **Rural Routes in Chapter 6**

The first part of each Chapter includes the following:

- **Typical Recommended Cross Section**

- **Table of Desirable Route Characteristics**
- **Typical Route Segment in Plan View**

Together, these elements define the basic criteria for the route type.

The second part of each chapter provides more detailed information about the specific design features including:

- **Signalization**
- **Intersection Improvements**
- **Add Lanes**
- **Bus Service**
- **Access Control Concepts**
- **Median Control**
- **Structural Clearance Improvements**
- **Roadway Design Criteria**
- **Pavement Marking**
- **Drainage**
- **Bicycle Accommodation**

The third part of each chapter provides information on:

- **Criteria for Using Special Techniques**
- **Typical Environmental Considerations**

SECTION THREE: Using Techniques for Special Circumstances

Because each SRA route is different, the desired configuration for each route will also differ. Not only are rural routes different from suburban, and suburban routes different than urban, but routes which might all be classified as suburban may have very different characteristics. Existing rights-of-way, roadway features, adjacent land use and access characteristics vary from route to route, and could also change from one section to another along any given route. Working within different constraints imposed by the conditions along the SRA routes suggests that options need to be available in planning the SRA system. These techniques for special circumstances are also defined for each route type:

- **Urban Routes in Chapter 7**
- **Suburban Routes in Chapter 8**
- **Rural Routes in Chapter 9**

Each of these chapters defines techniques to be considered where the recommended criteria cannot be applied or where special design features may be desirable such as:

- **Intersections with other SRAs, expressways, tollways, or rail lines**
- **Locations of environmentally sensitive uses (schools, hospitals, parks)**
- **State or other jurisdictional boundaries**
- **Designated future expressway or rapid transit corridors as proposed in the 2010 Transportation System Development Plan**
- **Locations of existing rail or bus transit stations**
- **Locations of inadequate or excess right-of-way**

The circumstances where each of the special techniques or design features could be applied are cross-referenced to Chapters 4, 5 and 6 on Recommended Designs and Features.

CHAPTER 4
URBAN SRA ROUTES

4.1 INTRODUCTION

Desirable route characteristics for urban SRA routes in the year 2010 have been developed to insure adequate traffic service and geometric design while working within the constraints of limited right-of-way and dense development adjacent to the roadway. Measures to increase capacity will typically be associated with traffic signalization, access, and parking rather than widening or other major new construction.

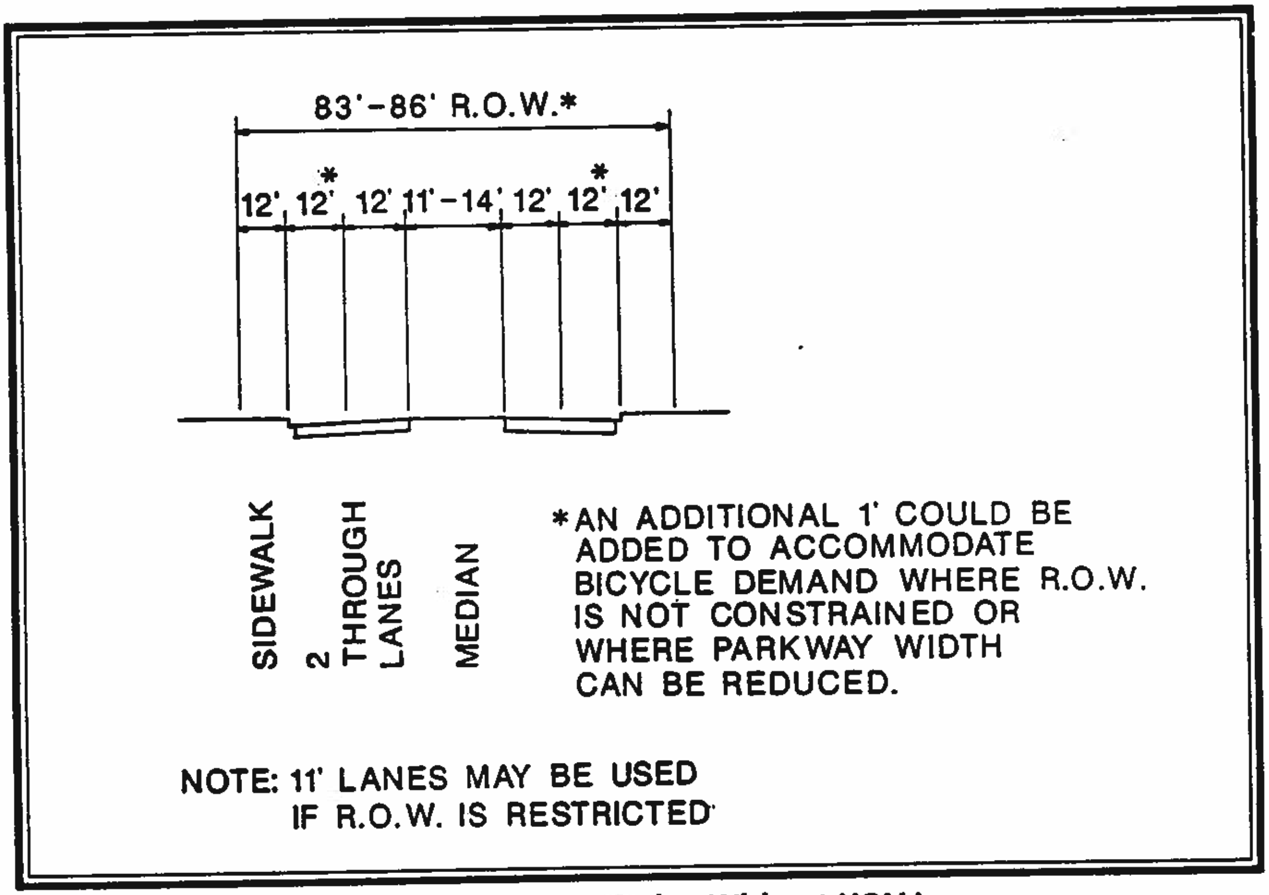


Figure 4.1A Desirable Urban SRA Cross-Section Without HOV Lanes

Table 4.1 lists the desirable characteristics for urban SRA routes in 2010. These characteristics are the basis for the desirable urban cross-sections for two-way streets shown in *Figures 4.1A* and *4.1B* and the typical design configuration in *Figure 4.2*. The remainder of this chapter describes design features along with recommended standards and policies.

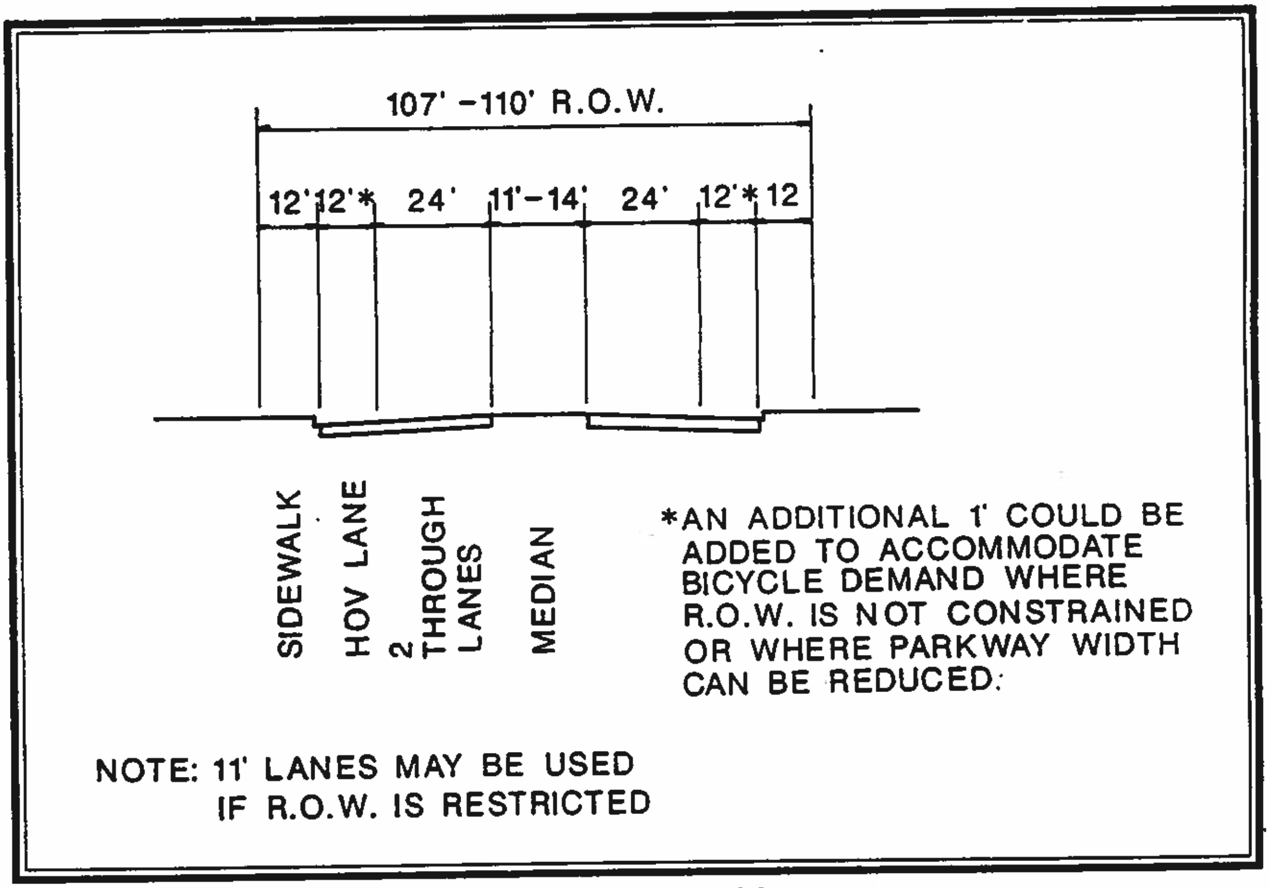


Figure 4.1B Desirable Urban SRA Cross-Section With HOV Lanes

Table 4.1
2010 Desirable Route Characteristics
Urban Strategic Regional Arterials

Right-of-way Width	107' - 110'*
Level of Service (Peak Hour)/Design Speed	D / 35 mph
Number of Through Lanes	2 in each direction: 12' width desirable 11' width minimum
Bicycle Accommodation	13' outside lane desirable
Median Width	14' desirable, 11' minimum
Right Turns	Yes, in curb lane
Left Turns	Permitted along entire length of arterial
Shoulders	Not applicable
Curbs	Yes, with 1' - 2' gutters
Sidewalks	Yes, 10' width when adjacent to curb
Parking	Not recommended, replace with off-street parking**
Cross Street Intersections	Signals with arterials and collectors
Curb Cut Access	Right-in/Right-out preferred
Transit	Bus/HOV lanes in peak hours***; Local bus service with signs, shelters, and signal preemption potential
Number of Traffic Signals Per Mile	4 are desirable
Signalization	Synchronized network with pedestrian actuation where needed
Freight: Vertical Clearance	14'-6"
Loading	Loading zone with peak hour restrictions or alley loading

* 83' - 86' where bus/HOV lanes are not provided
** where criterion and conditions of Section 4.3 are met
*** where criteria and conditions of Section 4.4 are met

Table 5.1
2010 Desirable Route Characteristics
Suburban Strategic Regional Arterials

Right-of-way Width	120' - 150'
Level of Service (Peak Hour)/Design Speed	C or D / 45 mph
Number of Through Lanes	3 in each direction; 12' width
Median Width	18' - 48', raised
Bicycle Accommodation	13' outside lane desirable
Right Turns	Turn lanes at all major intersections
Left Turns	Dual left turn lanes at all major intersections
Shoulders	Where appropriate, 10' width paved
Curbs	Yes, with 2' gutters
Sidewalks	Where appropriate, 5' width
Parking	Not recommended
Cross Street Intersections	Signals with collectors and arterials New local roads right-in/right-out only
Curb Cut Access	Consolidate access points at 500' spacing with cross easements
Transit	Bus turnouts, signs and shelters. Express bus service only. Signal pre-emption and HOV potential.
Number of Traffic Signals Per Mile	4 maximum
Signalization	Synchronization with pedestrian actuation where needed.
Freight: Radii Vertical Clearances	WB-55 typical/WB-60 Type II truck route New structures: 16'-3" Existing Structures: 14'-6"
Railroads	Evaluate the need for a grade separation at all railroads
Loading	Off-street loading

5.2 RECOMMENDED DESIGNS AND FEATURES

5.2.1 Signals

All signalized intersections on suburban SRA routes should be fully-actuated. Fully-actuated means that all approach and left-turn lanes are capable of detecting vehicles and adjusting signal timings.

Where feasible, all signalized intersections at spacings along suburban SRA routes of 1/2 mile or less, should be interconnected into signal systems. The interconnection is used to provide signal coordination and vehicular progression along the SRA. All signal systems along suburban SRAs should be timed for vehicular progression based on a traffic engineering study. The signal timings should be evaluated every three to five years to determine if they are adequate for current traffic patterns.

All signalized intersections on suburban SRA routes should be capable of priority preemption for express bus service. This preemption capability should only be used to keep buses on schedule, as described in Section 5.2.5 in this chapter. The preemption by buses should be coordinated with vehicular progression along the SRA route.

The goal of traffic signal timings along suburban SRA routes is to achieve a level-of-service C for the arterial through lanes. To achieve this, it may be necessary to lower the level-of-service for the turning movements and cross-streets to maximize the through movements on the SRA.

5.2.2 Roadway Design Criteria

The Design Criteria for suburban SRA routes shown in *Table 5.2* should serve as a guide for identifying substandard roadway features and specifying their subsequent improvement.

Where right-of-way is available, construction of new roadway features such as grade separations and route bypasses should follow the recommended design criteria. Partial access control should be considered on route bypasses proposed on undeveloped land.

5.2.3 Intersections

For suburban SRA routes, left turn lanes should be provided at all existing intersections; left and right turn lanes should be provided at all major signalized intersections. Right-of-way should be protected to convert the major suburban SRA intersections to dual left turn lanes as volumes warrant. At many suburban intersections turning movements are very high and may warrant double left turn lanes. Double left turns have been used with success in the Chicago metropolitan area.

When turn lanes are developed, the turn bay storage should be 1.5 to 2 times the expected arrival rate of vehicles over one cycle at signalized intersections. Where turn bay storage is inadequate, the storage capacity should be increased. This can be done by lengthening the existing storage bay or reconstructing the intersections to have dual left turn lanes. Projected vehicular storage lengths should exceed 350 feet before dual left turn lanes are proposed as a year 2010 improvement. At unsignalized intersections, turning lengths should be determined by traffic studies undertaken on a case-by-case basis.

Table 5.2
Suburban SRA Roadway Design Criteria

Route Type	Suburban
Horizontal Alignment	
Minimum Design Speed	45 mph
Minimum Stopping Sight Distance	325'
Minimum Radius Horizontal Curve	740'
Maximum Degree of Curvature	7° 45'
Maximum Superelevation	4%
Minimum Length of Superelevation - Six Lane Section - Four Lanes w/small probability of Six Lanes	 234' 192'
Horizontal Clearance	2'
Vertical Alignment	
Maximum Grades	6%
Length Crest Vertical Curve	Compatible with Design Speed
Length Sag Vertical Curve	Compatible with Design Speed
Vertical Clearance (Minimum New Construction)	16'-3"
Vertical Clearance (Minimum Reconstruction)	14'-6"

Due to problems of sight distance and intersection width, double left turns should be used under "protected only" phasing. "Protected only" phasing means that a left turn movement is allowed only on a green arrow and not during the green ball phase for the through movement. All dual left turn lanes must be protected by a raised median between opposing lanes.

Certain suburban SRA routes are diagonal arterials that originate in the central Chicago area. These diagonal arterials frequently intersect with other arterials constructed on the conventional grid pattern which can create intersection triangles. It is recommended that signal timings be optimized to provide progression along the suburban SRA route through the intersection triangle. Construction of a grade separation for the SRA may be considered, subject to an evaluation of right-of-way availability and access requirements.

It is recommended that suburban SRA intersections with new local roads be restricted to right-in/ right-out movements. A raised median for the suburban SRA route will restrict left turn movements from the SRA to the local road, left turn movements from the local road to the SRA and through movements across the SRA for the local road. Alternative routes and emergency vehicle response times must be evaluated in each instance, however, before this can be ultimately implemented.

Radii for right-turn movements on suburban SRA routes should be able to accomodate a WB-55 design vehicle without encroachment into oncoming traffic. If the suburban SRA route is designated a Class II truck route, the turning radii should accommodate a WB-60 design vehicle.

5.2.4 Add Lanes

The protection of right-of-way along suburban SRA routes will allow for the eventual development of the desirable suburban cross section. *Figure 5.1* shows both the desirable cross section and corresponding right-of-way requirements for the suburban SRA.

Once the right-of-way is acquired, the desired cross-section with three through lanes in each direction and raised median can be achieved by widening the existing roadway. In some cases, areas that were once shoulders and open ditches would be utilized to construct additional through lanes.

5.2.5 Express Bus Service with Priority Preemption

Bus service on suburban SRA routes should be limited to express buses which are equipped with priority signal preemption capability that can be deployed when they are running behind schedule. However, the bus preemption should be coordinated with existing vehicular progression along the SRA route. Bus stop locations should occur every one-half to one mile.

Considerations in the location of bus stops include intersecting bus routes with a corresponding potential for transferring riders and locations of residential, commercial, retail or office developments to be served along the route.

The stops would be designed as turnouts, consistent with **Pace Development Guidelines**. Walkways to stops of intersecting services would facilitate transfers and promote safety. Near-side and far-side bus stop configurations would be planned to minimize distance between connecting lines.

5.2.6 Access Management

It is recommended that curb cut access be limited to right-in, right-out traffic movements. In suburban areas where numerous curb cut access points to properties are present, it is recommended that the access be consolidated into single points at desirable spacing of 500 feet between access points as

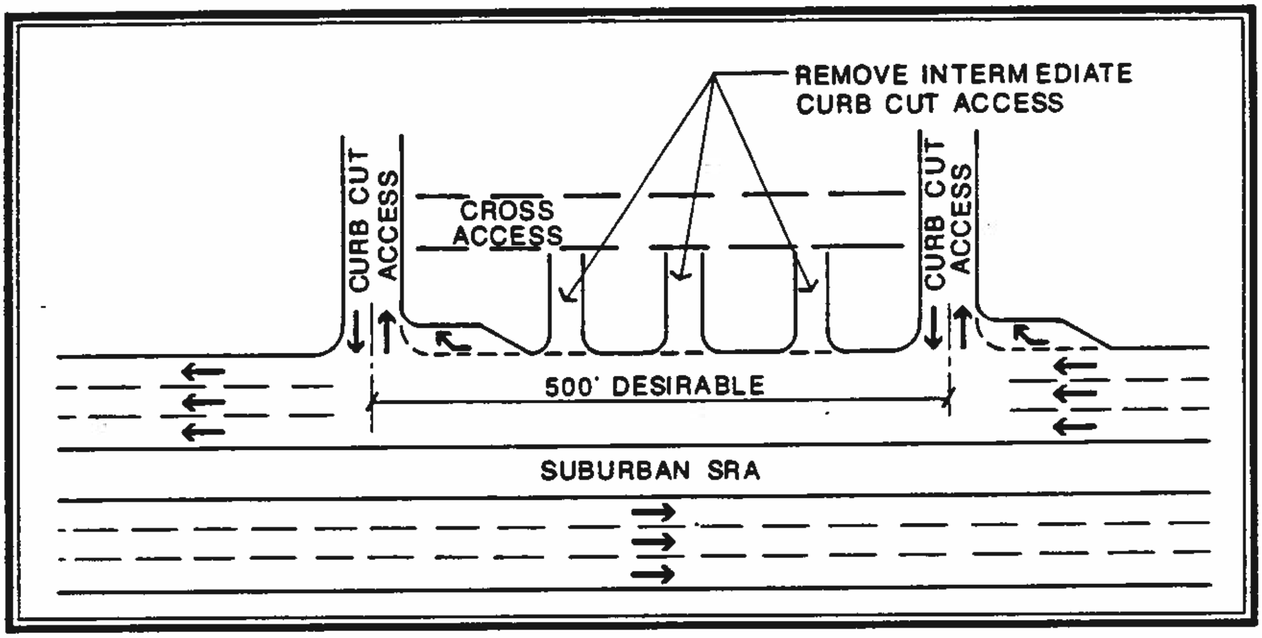


Figure 5.3 Consolidated Access

shown in *Figure 5.3*. The properties would need to be interconnected through the use of cross access easements, as discussed in Section 4.2.6 of Chapter 4.

Where it is necessary to allow left turns into access points, efforts should be made to provide adequate turn bay storage. Increasing turn bay storage at these locations to accommodate left turn queues during peak periods will remove turning traffic from the through lanes. An example of this idea is shown in *Figure 4.5*.

Circulation using internal access roads is recommended for all new development and redevelopment. This circulation should accommodate autos, delivery vehicles, transit, and bicycles. Sidewalks are recommended to facilitate pedestrian circulation. *Figure 5.4* displays a possible configuration. Requirements for access to the SRA and internal circulation should be considered as part of the development approval process. Internal cirulation roadways should facilitate transit opera-

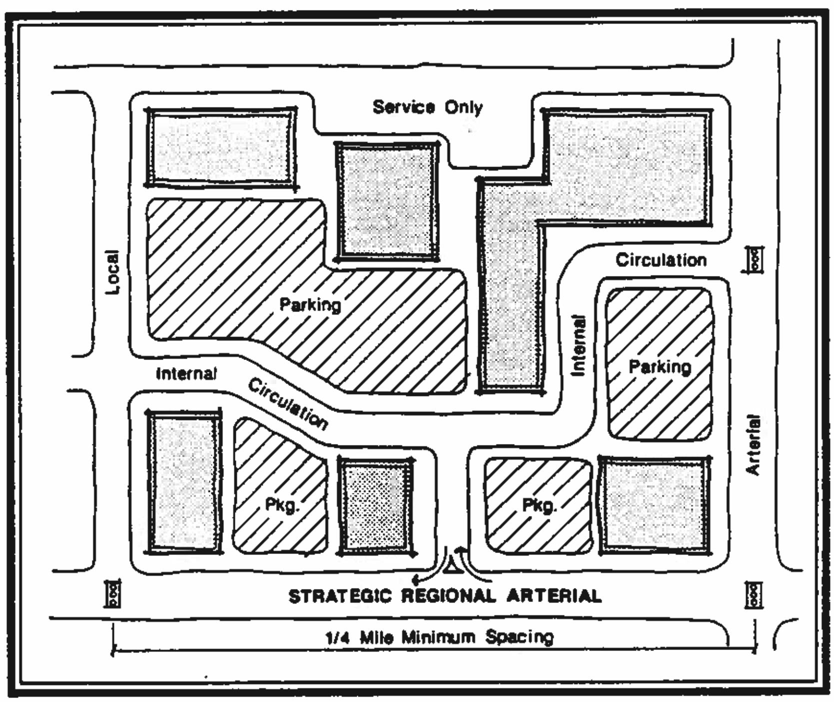


Figure 5.4 Internal Circulation

tions by reducing the number of times buses enter/leave the SRA. The SRA and internal roadways should be designed to provide convenient transit access to buildings.

If a signal is warranted at the local road as shown on *Figure 5.4*, the spacing should not be less than 1/4 mile to an adjacent signal.

5.2.7 Median Control

It is recommended that all suburban SRA routes have a raised median with a minimum width of 18 feet. This will permit left turn movements from the SRA only at desired intersections. However, if some unsignalized median crossovers became necessary during project planning, then the minimum median width should be 22 feet. The raised median is an effective tool to provide the level of service desirable on suburban SRA routes.

5.2.8 Structural Clearance Improvements

All structures along suburban SRA routes should have a 14 feet - 6 inches vertical clearance. Existing structures that do not meet this requirement are candidates for modification. Improvement of inadequate horizontal and vertical clearances at structures will improve the mobility of freight vehicles along suburban SRA routes. The recommended method to improve vertical structural clearances where the SRA route is in an underpass is to physically lower the suburban SRA roadway. Potential drainage and utility problems should be carefully evaluated when this method is proposed.

5.2.9 Stop Sign Removal

Stop sign control for traffic movements on an SRA route is contrary to the concept of an SRA having priority of through movement. Stop sign control used on through lanes of any suburban SRA route should be removed and a traffic engineering study performed to determine appropriate traffic control at the location. The removal of stop signs is recommended for the SRA route only and not the intersecting cross-streets.

5.2.10 Pavement Markings

High-type pavement markings should be used on suburban SRA routes. High-type pavement markings include thermoplastics, epoxy and pre-formed plastics. It is recommended that high-type pavement markings be used because they provide a durable and highly visible striping material

Raised pavement markers should also be used on suburban SRA routes. Raised pavement markers are a cost-effective technique to promote greater safety and are particularly beneficial during inclement weather. The spacing of raised pavement markers should be in accordance with IDOT District One raised reflective pavement marker standards. Raised pavement markers should also be placed on top of raised median curbs.

5.2.11 Drainage

On suburban SRA routes roadway drainage generally consists of an enclosed system. During roadway reconstruction for lane additions or intersection widening, the existing drainage system should be assessed for capacity or flooding problems. Any improvements to the existing drainage system must be in accordance with the procedures and values in the IDOT Drainage Manual.

5.2.12 Right-of-Way Acquisition and Protection

A major goal of the SRA planning process is to identify and protect future right-of-way needed to construct the ultimate roadway design and configuration. It is recommended that right-of-way be protected as soon as possible after it is identified. Suburban rights-of-way may adjoin both developed and undeveloped properties.

It is recommended that local governments work with roadway jurisdictional agencies to insure that adequate right-of-way for the SRA is provided in the approval process for new development. Local governments should review their building setback requirements to locate all new construction outside the ultimate right-of-way width to protect the ability to expand the right-of-way in the future.

Acquisition of easements and rights-of-way adjacent to undeveloped land may be more feasible in some circumstances when the local development approval allows the entire site to be used in calculations of how much land is available for development. *Figure 5.5* displays how the site would be measured.

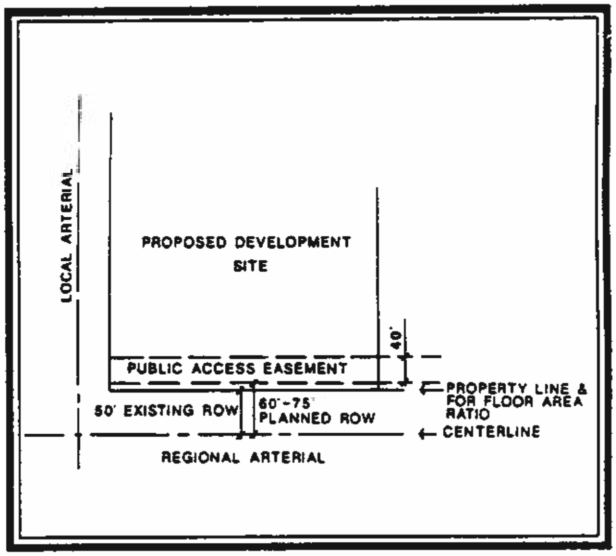


Figure 5.5 Land Available for Development

5.2.13 Railroad Crossings

The grade separation of suburban SRA routes from intersecting railroads can increase capacity and safety. The feasibility of this improvement is dependent upon projected traffic volume, roadway characteristics, duration and volume of rail movements and amount of right-of-way available for its construction.

All at-grade railroad intersections with suburban SRA routes should be evaluated for grade separations. Preference for grade separation construction may be given to freight rail crossings where delays due to length of freight trains are considerably longer than at crossings for passenger rail lines. However, the requirement for grade separation at commuter rail lines is important to consider because peak rail and roadway traffic always coincide. Additional factors to assess include proximity of rail line to adjacent arterial intersections, access requirements, right-of-way availability and projected traffic volumes on the suburban SRA route.

At all locations where railroad grade separations are not feasible, the use of constant time warning devices should be investigated. Constant time warning devices adjust the down time of the gates based on the speed of the train. This helps reduce excessive delay to vehicular traffic caused by gates being down when trains are not present. This type of device can also recognize when a train is stopped. This can be beneficial where a train station is near an at-grade rail crossing and trains loading and unloading passengers trigger the gates to go down even though the train is not in the intersection.

5.3 CRITERION AND CONDITIONS FOR REMOVAL OF ON-STREET PARKING

On-street parking is currently permitted on some portions of SRA routes in suburban areas. In areas where parking is allowed, there may be restrictions on parking during peak hours.

The general criterion and conditions for institution of "No Parking" regulations along suburban SRA routes are shown below. One or more of the conditions should apply and the criterion should be met before parking is removed.

Conditions

Less than the Minimum Number of Travel Lanes On segments where the suburban SRA minimum standard of two lanes in each direction is not provided, on-street parking should be prohibited. The curb parking lane should be converted to a through lane.

Less than the Minimum Level of Service On segments where the projected level of service is below the suburban SRA minimum standard of C for peak hour, on-street parking in peak hours should be prohibited, with the curb lane being converted to a through lane.

High Accident Rate Parking should be relocated along segments of suburban SRA routes that pose a safety hazard due to high accident rate. If the accident rate is 5 per year per 10,000 average daily traffic (vehicles) or greater, then parking should be relocated.

Criterion

Alternative Off-Street Parking Available If adequate off-street parking exists in public or private lots/garages, on-street parking can be eliminated. If the existing supply is not adequate to absorb those vehicles currently parked on-street, vacant or under-utilized parcels of land in the vicinity provide an opportunity to develop additional off-street parking. A public agency would be responsible for purchase of the land and development of a parking facility.

5.4 CRITERIA AND CONDITIONS FOR IMPLEMENTATION OF HOV LANES

High occupancy vehicle (HOV) lanes designated for buses, carpools and vanpools may be appropriate in selected areas with high levels of transit ridership and ridesharing activity. There should also be adequate capacity to accommodate traffic in general use lanes. The following criteria and conditions are applicable using a with-flow HOV lane along the curb or median. In suburban areas, institution of an HOV lane would generally involve new construction. It would be designed primarily for buses, although carpools and vanpools would also be encouraged.

The general criteria and conditions are shown below. One or more of the conditions should apply and all of the criteria should be met before an HOV lane is implemented.

Conditions

High Level of Usage: Curb Lane Route segments should have an existing or projected transit ridership of at least 1200 one-way passengers in the peak hour. A curb HOV lane would be expected to be utilized almost exclusively by buses. Existing or projected bus volumes should be 15-40 vehicles in the peak hour one way.

High Level of Usage: Median Lane Route segments should have an existing or projected usage of 2400 one-way passengers or rideshare occupants in the peak hour. A higher demand threshold has been established for a median HOV lane to reflect the potential for higher costs and operational problems associated with implementation.

Criteria

Reduce Total Person Delay There should be a net reduction in the average travel time per person for all users of the route.

Minimal Disruption to Traffic Operations It must be feasible to institute turn restrictions and signalization adjustments necessary for HOV improvement with only minimal disruption to traffic flow in the general use lanes.

No Peak Hour On-Street Parking or Loading For implementation of a curb HOV lane, it must be feasible to prohibit parking and loading in the curb lane.

More Than Desirable Right-of-Way Available In suburban areas, the desirable cross-section of three lanes in each direction must be provided within available right-of-way; right-of-way not required for the three through lanes could be designated for HOV lanes.

5.5 BICYCLES AND PEDESTRIANS

On suburban SRA routes more options are available for handling pedestrian and bicycle access. For example, while right-of-way availability is still a critical issue, dense development immediately adjacent to the roadway is not as common an occurrence as in urban areas. Also, in suburban situations, the alternative parallel routes may not always be available. Under all situations, the goal is to have a continuous system of bicycle and pedestrian facilities. Handicapped access ramps for pedestrians will be constructed at intersections and curb cut locations, consistent with appropriate state and local policies and standards.

Provisions for bicycles and pedestrians may be accommodated within the SRA right-of-way itself. The choice of how to provide access within the SRA corridor should be based on each situation. In order to allow vehicles sufficient room to pass slower-moving cyclists, the outside curb lane could be widened to 13 feet to accommodate bicycle travel. Where right-of-way is constrained, this additional width could be taken from the parkway. This solution provides a minimal width to safely allow experienced cyclists access to destinations along the SRA, while not encouraging continuous bike travel on the SRA.

As in the cases of the urban and rural SRA routes, access across major obstacles or barriers will be handled by the SRA if alternative access is not feasible.

5.6 TYPICAL ENVIRONMENTAL CONSIDERATIONS

The environmental analysis component of the SRA planning process is primarily an inventory of existing conditions. The purpose of the inventory is to identify those environmental characteristics which may not be compatible with potential roadway improvements or an increase in traffic volumes. Detailed environmental assessments will be performed when SRA improvements move into preliminary design engineering.

Each route type can be expected to provide slightly different environmental concerns. Environmental considerations important to suburban route types are likely to include, at a minimum, land uses that:

- Are sensitive to noise: nursing homes, hospitals, auditoriums, residential areas, and schools;
- Are gathering places for children: schools, parks, and recreation facilities; and
- Generate large volumes of traffic: regional shopping centers, business parks, and major office buildings.

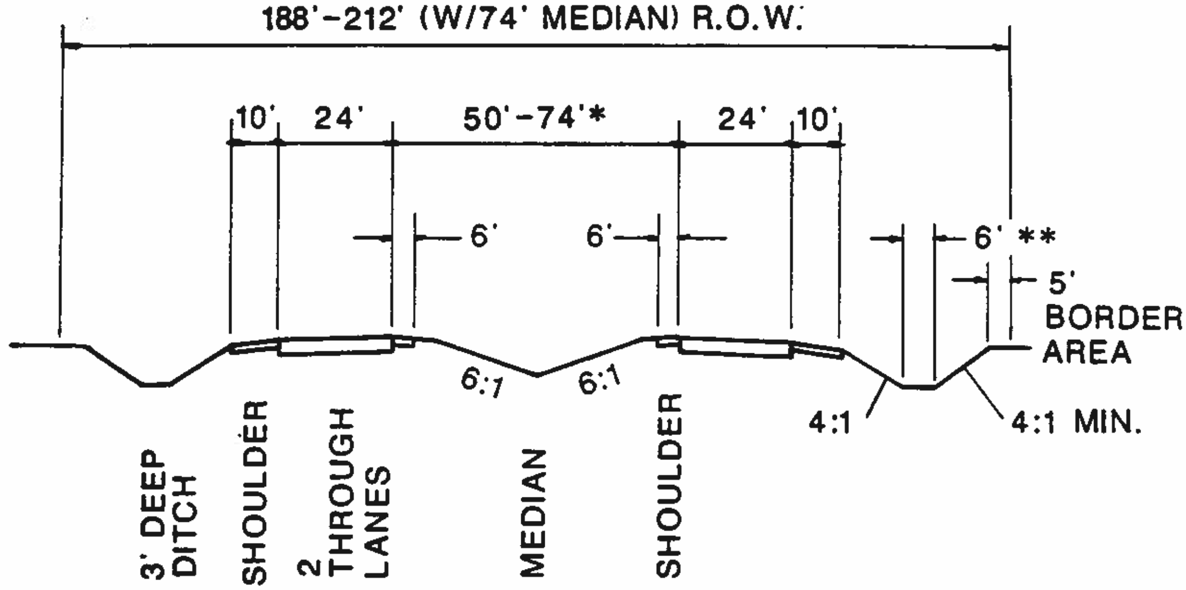
Other environmental concerns include but not limited to:

- Public open space, parks and recreation areas, scenic areas and designated natural areas, nature preserves, historic areas, sites and structures, cemeteries, and floodplains and retention/detention areas,
- Publicly-owned properties,
- Multiple land use plans and varying growth rates,
- Neighborhood boundaries,
- Air quality,
- Hazardous materials,
- Cemeteries,
- Rivers, streams and wetlands,
- Threatened and endangered species and their habitat,
- Sight screening,
- Effects of roadway lighting on existing light canopy,
- Drainage,
- Water quality,
- Tree preservation,
- Agricultural preservation,
- Visual/Aesthetic impact.

CHAPTER 6
RURAL SRA ROUTES

6.1 INTRODUCTION

Desirable route characteristics for rural SRA routes in the year 2010 have been developed to insure adequate traffic service and geometric design as well as protection of right-of-way for needs beyond the year 2010. Key features designed to maintain acceptable operating speeds and enhance safety include two-way frontage roads, left turn lanes at all intersections, and wide medians.



*USE A 74' WIDE MEDIAN WHERE THERE IS A HIGH PROBABILITY OF NEED FOR 3 LANES IN EACH DIRECTION IN THE FUTURE

**USE A 6' WIDE DITCH FOR DETENTION STORAGE AND CLEAR ZONE REQUIREMENTS.

Figure 6.1 Desirable Rural SRA Cross-Section without Frontage Roads

Table 6.1 lists the desirable characteristics for rural SRA routes in 2010. These characteristics are the basis for the desirable rural cross-sections on *Figure 6.1* and *Figure 6.3* and the typical design configurations in *Figures 6.2A* and *6.2B*. The remainder of this chapter describes design features along with recommended standards and policies.

4.2 RECOMMENDED DESIGNS AND FEATURES

4.2.1 Signals

All signals on urban SRA routes should be interconnected into signal networks or signal systems. Signal networks are beneficial in urban areas where grid patterns of signalized intersections, parallel one-way SRA routes, or intersecting SRA routes exist. The network should establish priority of through movement for the SRA route while providing coordination for the cross-streets. An example of signal networking is shown in *Figure 4.3*.

Where an urban SRA route is not located in a grid pattern of signalized intersections, or where numerous other signals are too close to establish a network, then signals along the SRA should be interconnected into a system to provide for progression of traffic. All new controllers should be compatible with signal pre-emption devices.

All signal networks and signal systems on urban SRA routes should be timed for optimal progression based on a traffic engineering study. The signal timing should be evaluated every three to five years to determine if they are adequate for current traffic patterns.

When timing traffic signals on urban SRA routes, a level-of-service D should be the lowest level-of-service accepted for the SRA through lanes for the peak hour. This may require the turning movements and cross-streets to operate at a lower level-of-service.

In many urban areas pretimed traffic signals are commonly used. If pretimed traffic signals which are not tied into the network are encountered along urban SRA routes, they should be evaluated for possible use as fully-actuated signals. Fully-actuated means that all approaches can detect vehicles and adjust signal timings. Having actuated approaches provides more flexibility in handling varying traffic flows, than the pretimed signals commonly used in urban areas. New technologies allow actuated signals to run as pretimed signals if necessary.

4.2.2 Roadway Design Criteria

The Roadway Design Criteria in *Table 4.2* will help identify substandard roadway features on urban SRA routes. Substandard features that adversely affect safety and/or capacity, such as insufficient vertical clearance or inadequate sight distance, should be corrected.

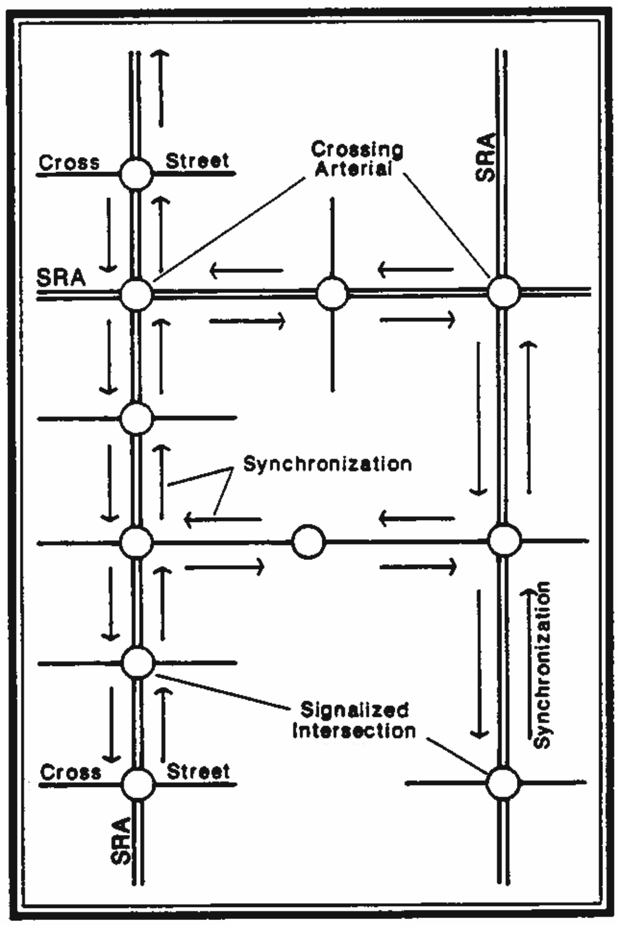


Figure 4.3 Signal Networking

Table 4.2
Urban SRA Roadway Design Criteria

Route Type	Urban
Horizontal Alignment	
Minimum Design Speed	35 mph
Minimum Stopping Sight Distance	225'
Minimum Radius Horizontal Curve	415' w/normal crown 345' w/S.E. = 4%
Maximum Degree of Curvature	14° 30'
Maximum Superelevation	4%
Minimum Length of Superelevation - Transition for 4 Lanes w/12'-14' Flush Median - Transition for 4 Lanes w/12'-14' Flush Median and HOV lanes	 231' 309'
Horizontal Clearance	2'
Vertical Alignment	
Maximum Grades	7%
Length Crest Vertical Curve	Compatible with Design Speed
Length Sag Vertical Curve	Compatible with Design Speed
Vertical Clearance (Minimum New Construction)	16'-3"
Vertical Clearance (Minimum Reconstruction)	14'-6"

4.2.3 Intersections

Where right-of-way is available, left turn lanes should be developed at all signalized intersections on urban SRA routes. Right turn lanes should be developed where warranted and right-of-way is adequate. On SRA routes, it is recommended that parking on the approach and far side be prohibited within 100 feet of all major intersections to allow for a right turn bay. Two through lanes should be maintained as a minimum on all urban SRA routes.

Corner radii should be kept to a minimum in order to maintain the shortest possible crossing distances for pedestrians where appropriate. Length of right turn bays should take into consideration parking needs.

When left turn lanes are developed, the turn bay storage should be 1.5 to 2 times the expected arrival rate of vehicles over one traffic signal cycle. Where turn bay storage is inadequate, the existing left turn bays should be reconstructed to increase the storage capacity and remove turning vehicles from the through lanes.

Where high left turn volumes occur at urban SRA intersections, double left turn lanes are recommended to alleviate congestion. However, double left turn lanes will only be feasible where right-of-way is adequate. If used, double left turn lanes must operate under "protected only" phasing. "Protected only" phasing means that a left turn is allowed only on a green arrow and not during the green ball phase for the through movement. All double left turn designs should be separated by a raised median between opposing lanes.

Certain urban SRA routes are diagonal arterials that originate in the central Chicago area. These diagonal arterials frequently intersect with other arterials constructed on the conventional grid pattern which can create intersection triangles. It is recommended that signal timings be optimized to provide progression along the urban SRA routes through the intersection triangle.

Intersection on urban routes with more than four approaches cause operational problems. Excess approaches can be removed by closing the approach, by conversion to one-way operation away from the intersection, or using extremely short signal timings to reduce the desirability of the approach. The most desirable configuration for intersections with more than four approaches would be to relocate the excess approaches away from the intersection. Right-of-way requirements make this concept difficult to implement.

On urban SRA routes with no median, it is recommended where feasible that left turns from the SRA to local streets be discouraged or prohibited or that consideration be given to proposing a one-way arterial pair. Movements between the local roads and the SRA should be restricted to the right-in/right-out type. The nature of urban street layouts, where there can be 8 to 12 streets per mile, make this a desirable technique because the alternative routing of local traffic is readily available. This technique should not be considered, however, if the local streets are organized with one-way operation.

4.2.4 Add Lanes

On urban SRA routes there is often little right-of-way available for physical roadway widening. Existing pavement areas are usually the only places where additional lanes can be obtained. For example, by removing parking from the curb lane it can be converted into a through lane if adequate off-street parking is available and compatible with adjacent land uses. A further discussion of removal of parking criteria and conditions can be found in Section 4.3 of this chapter.

4.2.5 Local Bus Service

On urban SRA routes which accommodate bus routes, a number of transit service enhancements should be reviewed to determine their potential for relieving traffic congestion. One basic technique is to restrict parking in the curb lane, either by removing or prohibiting parking during peak periods, with strict enforcement of parking restrictions, while allowing all vehicles to use the curb lane.

Bus stop turnouts are not considered practical on urban SRA routes. On a route-specific basis, however, both the location and spacing of bus stops, passenger amenities and signal pre-emption should be reviewed. Major objectives would be to eliminate stops if there are more than one in a block, and to eliminate conflicts with right turns. Where the blocks are short, as in the central area, stops could be located at every second block. The Chicago Transit Authority undertook a similar restructuring of bus stops on Michigan Avenue, achieving improved bus travel times as a result.

Another strategy to improve travel times is to establish exclusive lanes for buses and high occupancy vehicles during the morning and evening peak travel periods. This approach would be reserved for SRAs which have at least three traffic lanes in each direction. A companion measure essential to the effectiveness of exclusive lanes is minimizing access points to the roadway by eliminating curb cuts wherever possible. Section 4.4 provides further information about the suitability of HOV lanes in urban areas.

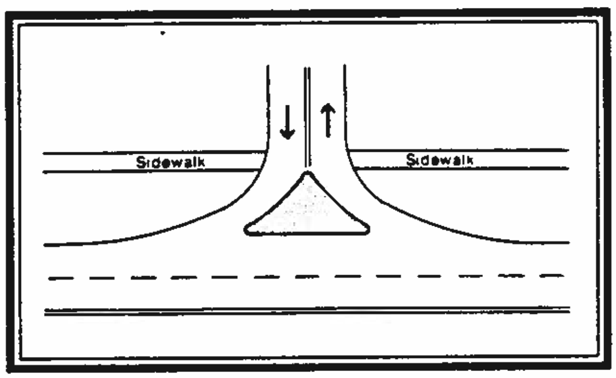


Figure 4.4 Driveway Channelization

4.2.6 Access Management

It is preferable that curb cut access, where permitted along urban SRA routes, should be of right-in, right-out design. This will prevent left turn movements onto the SRA across through traffic lanes. An example of this design is shown in *Figure 4.4*. Another desirable feature would be to minimize the number of access points by elimination or consolidation of curb cuts.

On urban SRA routes, left turn movements from the SRA into curb cut access points should be discouraged. However, where prohibition is not feasible, adequate turn bay storage should be provided. This will remove turning traffic from through lanes. A technique for increasing turn bay storage is shown in *Figure 4.5*.

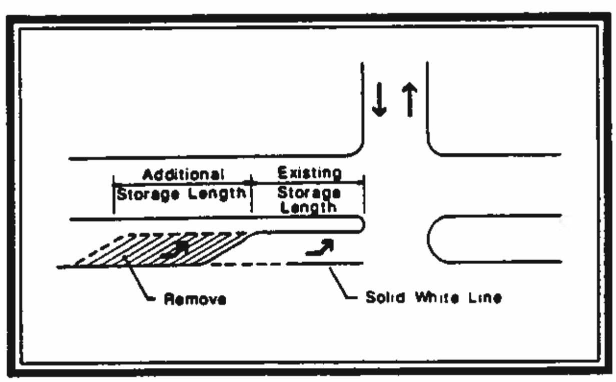


Figure 4.5 Increased Storage Capacity

Cross-access easement to allow vehicular movement between neighboring properties would reduce conflicts and improve safety by eliminating unnecessary turning movements. *Figure 4.6* displays one potential configuration for such easements.

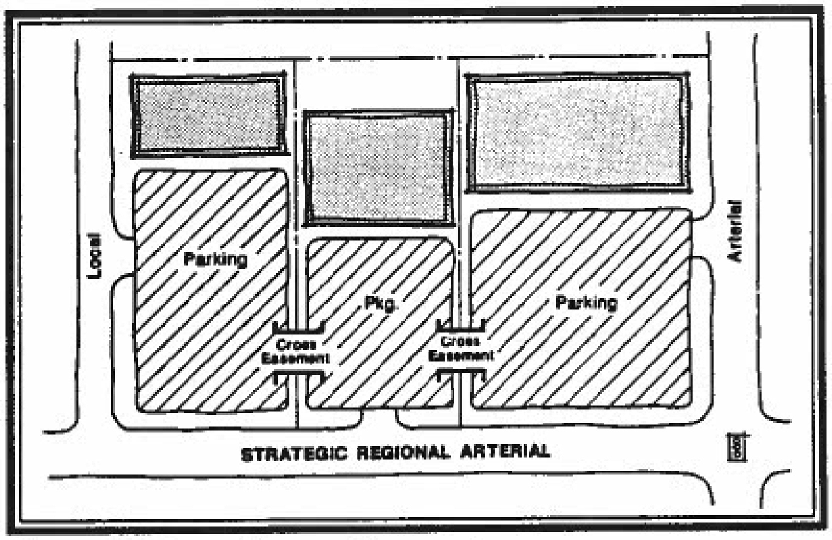


Figure 4.6 Cross-Access Easements

4.2.7 Median Control

The establishment of median control on urban SRA routes will provide protection for left turn vehicles, direct turning movements to desired locations, and reduce centerline conflicts. For urban SRA routes, it is recommended that a raised median be used to establish this control. The desirable dimensions for the urban median are shown on *Figure 4.1*.

A flush or painted median can also offer a measure of median control in areas where limited right-of-way or access requirements render a raised median undesirable.

4.2.8 Structural Clearance Improvements

The clearance criteria for urban SRA routes on *Table 4.2* are directed towards modification of existing facilities. This is mainly due to the general unavailability of necessary right-of-way in urban areas and the high capital costs to construct new facilities.

Horizontal clearances along the urban SRA routes should allow for two 12 foot through lanes in each direction plus two feet from face of curb to face of obstruction. Obstructions within the desirable clearance should be modified or reconstructed if feasible. Bridge railings and abutments are examples of obstructions that should conform to this criteria.

To provide for the unrestricted movement of heavy vehicles on urban SRA routes, vertical clearance may need to be improved. Bridges that do not provide 14 feet - 6 inches of clearance above the roadway are candidates for modification. Where the SRA route is in an underpass, the recommended method to increase vertical clearance is a physical lowering of the urban SRA roadway. Potential drainage and utility problems should be carefully evaluated when this method is proposed. If lowering of the roadway is not feasible, reconstruction of the structure is an alternative.

4.2.9 Stop Sign Removal

Stop sign control for traffic movements on an SRA route is contrary to the concept of an SRA having priority of through movement. Stop sign control on through lanes of any urban SRA route is inappropriate.

A traffic engineering study should be performed to determine traffic control appropriate to the location. The removal of stop signs is recommended for the SRA route only and not the intersecting cross-streets.

4.2.10 Pavement Markings

High-type pavement markings should be used on urban SRA routes. High-type pavement markings include thermoplastic, epoxy and pre-formed plastics. It is recommended that the high-type pavement markings be used because of durability and visibility.

Raised pavement markings should also be used on urban SRA routes. Although street lighting is prevalent in the urban environment, raised pavement markers would introduce an element of safety to the SRA route during inclement weather. The spacing of raised pavement markers should be in accordance with IDOT District One raised reflective pavement marker standards.

4.2.11 Drainage

Drainage problems are intensified in urban areas where high runoff coefficients are often coupled with storm drainage systems of inadequate capacity. Narrow traffic lanes in curbed sections may be unusable for long periods after a storm as standing water makes them hazardous or impassable. These drainage problems should be corrected in conjunction with other roadway reconstruction projects. The IDOT Drainage Manual will guide the design and construction of all drainage improvements.

4.3 CRITERION AND CONDITIONS FOR REMOVAL OF ON-STREET PARKING

On-street parking is typically permitted on portions of SRA routes in urban areas. In areas where parking is allowed, there may be restrictions on parking during peak hours. Impacts on local businesses and other land uses need to be assessed.

The general criterion and conditions for institution of "No Parking" regulations along urban SRA routes are shown below. One or more of the conditions should apply and the criterion should be met before parking is removed.

Conditions

Less than the Minimum Number of Travel Lanes On segments where the urban SRA minimum standard of two lanes in each direction is not provided, on-street parking in peak hours should be prohibited, with the curb lane being converted to a through lane.

Less than the Minimum Level of Service On segments where the projected level of service is below the urban SRA minimum standard of D for peak hour, on-street parking in peak hours should be prohibited, with the curb lane being converted to a through lane.

High Accident Rate Parking should be relocated along segments of urban SRA routes that pose a safety hazard due to high accident rate. If the accident rate is 5 per year per 10,000 average daily traffic (vehicles) or greater, then parking should be relocated.

Criterion

Alternative Off-Street Parking Available If adequate and convenient off-street parking exists in public or private lots and garages, on-street parking may be restricted. If the existing supply is not adequate or sufficiently functional to absorb those vehicles currently parked on the street, adjacent parcels (vacant or non-vacant) of land (in the vicinity) provide an opportunity to develop additional off-street parking. A public agency would be responsible for purchase of the land and development of a parking facility.

Provision of and funding for off-street parking should be carefully planned in order to provide convenient access before any SRA route parking is removed. This must be planned with the objective of reaching a mutually acceptable agreement with local government.

4.4 CRITERIA AND CONDITIONS FOR IMPLEMENTATION OF HOV LANES

High occupancy vehicle (HOV) lanes, designated for buses, carpools and vanpools, may be appropriate in selected areas with high levels of transit ridership and ridesharing activity. There should also be adequate capacity to accommodate traffic in general use lanes. The following criteria and conditions are applicable outside the central area of Chicago using a with-flow HOV lane along the curb or median. The HOV lane would not involve major new construction or right-of-way acquisition, i.e. existing pavement would be used. The facility would be designed primarily for buses, although carpools and vanpools would also be encouraged.

The general criteria and conditions are shown below. One or more of the conditions should apply and all of the criteria should be met before an HOV lane is implemented.

Conditions

High Level of Usage: Curb Lane Route segments should have an existing or projected transit ridership of at least 1200 one-way passengers in the peak hour. A curb HOV lane would be expected to be utilized almost exclusively by buses. Existing or projected bus volumes should be 15 to 40 vehicles in the peak hour one way.

High Level of Usage: Median Lane Route segments should have an existing or projected usage of 2400 one-way passengers or rideshare occupants in the peak hour. A higher demand threshold has been established for a median HOV lane to reflect the potential for higher costs and operational problems associated with implementation.

Criteria

Reduce Total Person Delay There should be a net reduction in the average travel time per person for all users of the route.

Minimal Disruption to Traffic Operations It must be feasible to institute turn restrictions and signalization adjustments necessary for HOV operations with only minimal disruption to traffic flow in the general use lanes.

No Peak Hour On-Street Parking or Loading For implementation of a curb HOV lane, it must be feasible to prohibit parking and loading in the curb lane.

More Than the Minimum Number of Travel Lanes In urban areas, three through lanes should exist in each direction so that with one lane assigned for HOV use, the minimum standard of two through lanes is maintained.

4.5 BICYCLES AND PEDESTRIANS

Safe movement and accessibility are key issues for bicycles and pedestrians. The urban SRA corridors are likely to experience the greatest concentration of pedestrians and cyclists. The density of developments coupled with short trip-making encourage these travel modes. Additionally the urban SRA routes experience heavy traffic volumes. The SRA routes within these corridors are attempting to maintain maximum capacity within right-of-way constraints. In these urban areas close parallel routes are usually present and continuous. These parallel facilities should be identified as bicycle routes so that the SRA routes can focus on their primary responsibility – carrying regional traffic.

However, even with alternate routes, bicyclists can be expected to intermittently enter the SRA system to access destinations along the routes. In order to avoid interruptions of traffic flow caused by vehicles attempting to pass slower-moving cyclists, the outside curb lane could be widened to 13 feet to accommodate bicycle demand. Where right-of-way is constrained, this additional width could be taken from the parkway. This solution provides a minimal width to safely allow experienced cyclists access to destinations along the SRA, while not encouraging continuous bicycle travel on the SRA.

The design of most urban SRA routes already includes sidewalks for pedestrians and should continue to do so under maximum design. Handicapped access ramps for pedestrians will be constructed at intersections and curb cut locations, consistent with appropriate state and local policies and standards.

At major obstacles, such as river crossings, provisions need to be made to ensure that pedestrians and bicyclists have access across these barriers.

4.6 TYPICAL ENVIRONMENTAL CONSIDERATIONS

The environmental analysis component of the SRA planning process is primarily an inventory of existing conditions. The purpose of the inventory is to identify those environmental characteristics which may not be compatible with potential roadway improvements or an increase in traffic volumes. Detailed environmental assessments will be performed when SRA improvements move into preliminary design engineering.

Each route type can be expected to provide slightly different environmental concerns. Environmental considerations important to urban route types are likely to include, at a minimum, land uses that:

- Are sensitive to noise: nursing homes, hospitals, auditoriums, residential areas, and schools;
- Are gathering places for children: schools, parks, and recreation facilities;

- Generate large volumes of traffic: major activity concentrations, areas with inadequate parking;
- Are sensitive to loss of convenient parking; and
- Are sensitive to a change of thoroughfare character as increases in traffic levels are provided for.

Other environmental concerns include but not limited to:

- Public open space, parks, scenic areas and designated natural areas,
- Historic areas, sites and structures,
- Publicly-owned properties,
- Neighborhood boundaries,
- Air Quality,
- Hazardous materials,
- Cemeteries,
- Rivers, streams and wetlands,
- Threatened and endangered species and their habitat,
- Sight screening,
- Effects of roadway lighting on existing light canopy,
- Drainage,
- Water quality,
- Tree preservation,
- Visual/Aesthetic Impact, and
- Character of community and neighborhood commercial districts.

CHAPTER 5
SUBURBAN SRA ROUTES

5.1 INTRODUCTION

Desirable route characteristics for suburban SRA routes in the year 2010 have been developed to provide adequate traffic service and geometric design. Recommended features include three through lanes in each direction and turn lanes at intersections. Capacity-increasing measures will also include signal synchronization, transit and pedestrian amenities, and policies related to access and parking.

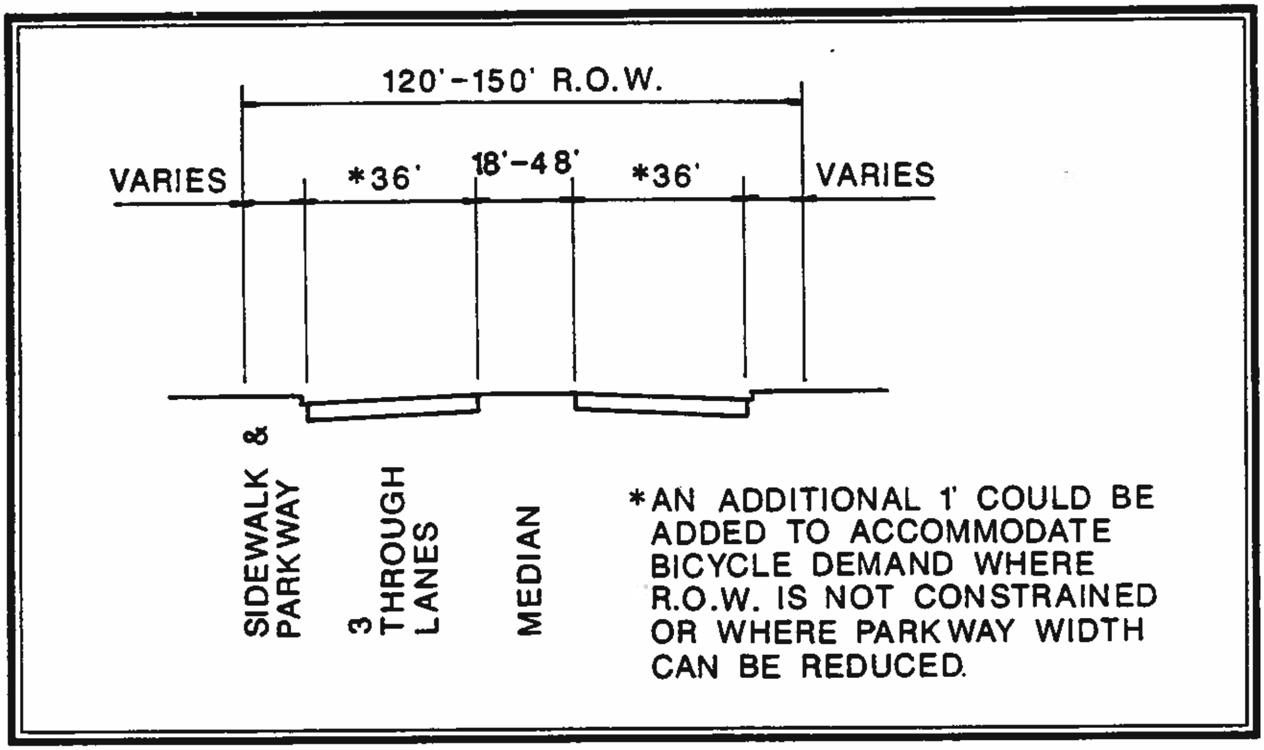


Figure 5.1 Desirable Suburban SRA Cross-Section

Table 5.1 lists the desirable characteristics for suburban SRA routes in 2010. These characteristics are the basis for the desirable suburban cross-sections on *Figure 5.1* and the typical design configuration in *Figure 5.2*. The remainder of this chapter describes design features along with recommended standards and policies.

Table 6.1
2010 Desirable Route Characteristics
Rural Strategic Regional Arterials

Right-of-way Width	188' - 284' (w/frontage roads)
Level of Service (Peak Hour)/Design Speed	C / 60 mph
Number of Through Lanes	2 in each direction, 12' width; with provision for future expansion to 6 total lanes
Median Width	50' - 74'
Right Turns	Turn lanes at major cross-streets
Left Turns	Turn lanes at all intersections
Shoulders	10' right paved; 6' left paved
Curbs	No
Sidewalks	If needed, along outside of frontage roads.
Bicycle Accommodation	Paved Shoulder (minimum 6')
Parking	No
Cross Street Intersections	Permitted. Stop sign control for cross street. Crossovers permitted at 1/2 mile spacing until frontage roads are constructed.
Curb Cut Access	Protect right-of-way for post-2010 construction of two-way frontage roads.* Right-in/right-out until frontage roads are constructed.
Transit	Bus pull-off and shelter. Express bus service and signal pre-emption potential
Number of Traffic Signals Per Mile	2, signals spaced 1/2 mile apart until frontage roads are constructed.
Signalization	Fully-actuated
Freight: Radii	WB 60; Standard
Vertical Clearance	New Structures: 16'-3" Existing Structures: 14'-6"
Railroads	Consider a grade separation at all railroads.
Loading	Off-street loading

*unless criteria and conditions of Section 6.3 are met

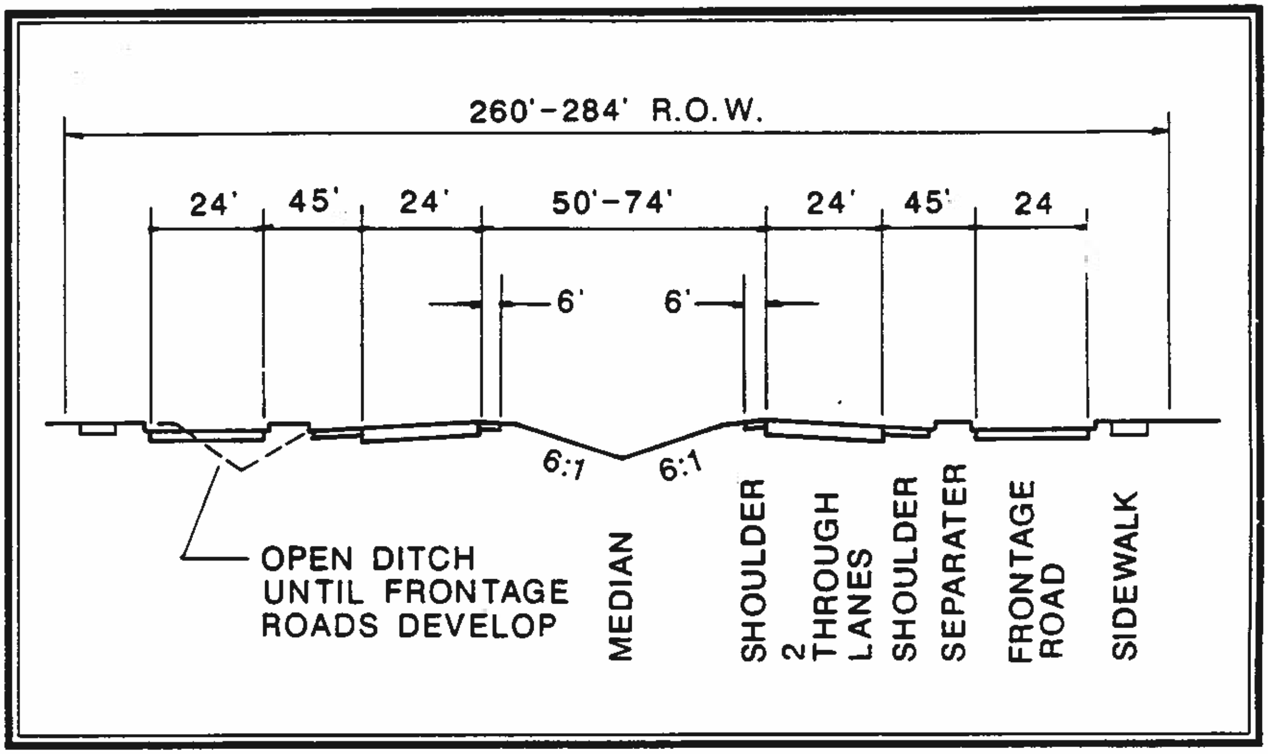


Figure 6.3 Desirable Rural SRA Cross-Section with Frontage Roads

6.2 RECOMMENDED DESIGNS AND FEATURES

6.2.1 Signals

All signals along rural SRA routes should be fully-actuated. Fully-actuated means that all approaches are capable of detecting vehicles and adjusting signal timings to respond to variance in traffic.

6.2.2 Roadway Design Criteria

The Roadway Design Criteria shown in *Table 6.2* are meant to guide the construction and reconstruction of roadway features on rural SRA routes. The construction of a bypass route or grade separation are examples of new roadway features that may be feasible along a rural SRA route.

In addition to guiding new construction, the design criteria can be used to identify substandard roadway elements that may lower capacity and pose safety problems on the rural SRA routes. Reconstruction would then be based on the recommended design criteria.

6.2.3 Intersections

At all signalized and major intersections along rural SRA routes, separate left and right turn lanes should be developed. The desirable configuration of two through lanes should be maintained along all rural SRA routes.

Table 6.2
Rural SRA Roadway Design Criteria

Route Type	Rural
Horizontal Alignment	
Minimum Design Speed	60 mph
Minimum Stopping Sight Distance	525'
Minimum Radius Horizontal Curve	1350'
Maximum Degree of Curvature	4° 15'
Maximum Superelevation	6%
Minimum Length of Superelevation	
- Transition for 4 Lanes w/probability of Six Lanes	234'
- Six Lane Section	258'
Horizontal Clearance	Compatible with Design Speed
Vertical Alignment	
Maximum Grades	5%
Length Crest Vertical Curve	Compatible with Design Speed
Length Sag Vertical Curve	Compatible with Design Speed
Vertical Clearance (Minimum New Construction)	16'-3"
Vertical Clearance (Minimum Reconstruction)	14'-6"

Where left turn lanes are developed, the turn bay storage should be long enough to store the expected arrival over an average 2 minute period during the peak hours.

As rural areas experience future development, caution should be exercised in the determination of the alignments of future streets. Situations such as intersection triangles, intersections with more than four legs and extreme intersection skews should be avoided.

6.2.4 Add Lanes

Additional through traffic lanes can provide the extra capacity needed to handle projected traffic. The most common form of lane addition to the rural SRA routes will be to widen the existing pavement. Additional right-of-way may be required for this improvement which should be designed in accordance with *Figure 6.1*.

6.2.5 Express Bus Service w/Priority Preemption

Bus routes operating on rural SRA routes should be limited to express services. The buses should have signal preemption capability which can be deployed when they are running behind schedule . Because of the higher speed characteristics of rural SRA routes, flag stops are not considered appropriate. Wherever possible, bus stops on these routes should be planned as public-private cooperative ventures in conjunction with activity centers. These off-the-road sheltered stops would also serve connecting routes and incorporate park-and-ride facilities. They should be located every five miles. Bus stops should be located on the actual SRA routes when there are no opportunities for off-road facilities, and/or to serve riders transferring from connecting services. These stops would be designed consistent with **Pace Development Guidelines** for bus stop location and passenger waiting areas, and they would be located to take maximum advantage of the ten foot wide right shoulder of the road.

6.2.6 Access Management

Because of the potential safety hazards introduced by intermittent access points, the most desirable form of access management for rural SRA routes is the frontage road. It is not recommended that frontage roads be constructed prior to year 2010 unless the criteria and conditions stipulated in Section 6.3 are satisfied. However, it is recommended that right-of-way be protected along all rural SRA routes as indicated in *Figure 6.2* for provision of frontage roads in the future.

When frontage roads are recommended, the most desirable arrangement is for them to operate as a two-way roadway and allow direct access to the rural SRA route from principal arterials, as shown on *Figure 6.2*. One-way frontage roads are permissible when safe, mid-mile slip ramps are present to provide access between the SRA and the frontage road, as shown on *Figure 6.4*.

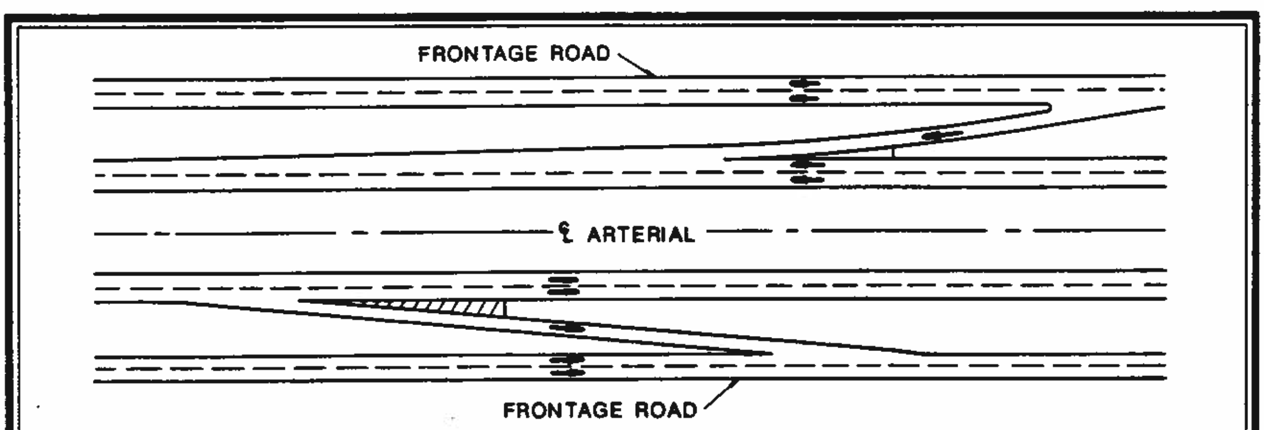


Figure 6.4 One-Way Frontage Roads

To allow optimal operations of intersections between rural SRA intersections with frontage roads and principal arterials, it is recommended that the lateral separation between the SRA and frontage road be increased to 400 feet, as shown on *Figure 6.2*. No development should be allowed to occur in the area between the SRA and the frontage road. This jughandle design of the frontage road intersection also protects right-of-way for post-2010 construction of a grade separation or single point diamond interchange for the rural SRA route. Modifications to this recommended frontage road design may be also evaluated provided that the level of service along the rural SRA route is not adversely impacted.

6.2.7 Median Control

The establishment of median control on rural SRA routes will provide protection for left turning vehicles, direct turning movements to desired locations and reduce centerline conflicts.

The recommended median type for the rural SRA route is the depressed median with a minimum width of 46 feet. The median width will allow eventual expansion of the rural SRA route from a 4 lane cross-section to a 6 lane cross-section by construction of the new lanes in the median with adequate median width to provide separate left turn lanes. Median crossovers should be permitted only for dedicated public roads, and the spacing of median crossovers should not be less than 1/2 mile. When frontage roads are constructed access should be consolidated to principal arterials and all mid-mile median crossovers should be removed. The minor arterial would form a "T" intersection with the frontage road.

The right-of-way dimensions shown on *Figure 6.1* are adequate for the development of a depressed median with paved inside shoulders and recoverable sideslopes for errant vehicles. Because the median sideslopes are traversable, centerline conflicts may not be totally eliminated. Impact attenuation devices may be necessary at obstructions such as bridge piers.

6.2.8 Structural Clearance Improvements

Freight hauling capacity of rural SRA routes could be increased by the improvement of inadequate vertical clearances at overpasses and other structures. Existing structures that do not provide the recommended standard vertical clearance of 14 feet - 6 inches should be evaluated for modification.

Vertical clearances can be improved by lowering the roadway profile beneath the structure. Drainage problems should be carefully evaluated when this method is proposed. The horizontal clear zone on the rural SRA is a function of speed, horizontal alignment, and sideslope and thus should be evaluated at individual locations.

6.2.9 Stop Sign Control Removal

Stop sign control for traffic movements on an SRA route is contrary to the concept of an SRA having priority of through movement. Stop sign control on through lanes of any rural SRA route is inappropriate. A traffic engineering study should be performed to determine appropriate traffic control to the location. The removal of stop signs is recommended for the SRA route only and not the intersection cross-streets.

6.2.10 Pavement Markings

All pavement markings at rural intersections should be of a high-type. High-type pavement markings include thermoplastic, epoxy and pre-formed plastics. High-type markings are more durable and have higher visibility than painted markings.

Raised pavement markers should be used along all rural SRA routes. The use of raised pavement markers can aid motorists during night driving and under poor weather conditions. Recent improvements in the design of raised pavement markers have made them less susceptible to damage caused by snowplows. The spacing of raised pavement markers should be in accordance with IDOT District One raised reflective pavement marker standards.

6.2.11 Drainage

An open ditch drainage system will be utilized on the rural SRA. Design of ditches and drainage appurtenances will conform to the standards set forth in the IDOT Drainage Manual.

6.2.12 Right-of-Way Protection

A major goal of the SRA planning process is to identify and protect future right-of-way needed to construct the ultimate roadway design and configuration. It is recommended that right-of-way be protected as soon as possible after it is identified. Rights-of-way may adjoin both developed and undeveloped properties.

It is recommended that local governments work with roadway jurisdictional agencies to insure that adequate right-of-way for the SRA is provided in the approval process for new development. Local governments should review their building setback requirements to locate all new construction outside the ultimate right-of-way width to protect the ability to expand the right-of-way in the future.

Acquisition of easements and rights-of-way adjacent to undeveloped land may be more feasible in some circumstances when the local development approval allows the entire site to be used in calculations of how much land is available for development. *Figure 5.5* displays how the site would be measured.

6.2.13 Railroad Crossings

It is recommended that right-of-way be protected at all rural SRA routes and railroad intersections for future grade separation construction for railroad crossings that have one or more trains per day.

Grade separations are particularly appropriate on rural SRA routes, which have high posted speeds, because of the safety element that they introduce. At freight rail line grade crossings, delays can be excessive because of the length of freight trains. At commuter rail lines, peak rail traffic and peak roadway traffic can coincide.

It is recommended that frontage roads parallel to the rural SRA route be grade separated from the railroad. Frontage roads should flare out an appropriate distance from the rural SRA grade separation so the sight lines to on-coming trains are not blocked by the grade separation structure.

It is recommended that the rural SRA route pass over the railroad wherever feasible. The vertical clearance requirement for the railroad is 23 feet - 6 inches. If the rural SRA route passes beneath the railroad, then enough right-of-way must be protected to permit construction of a temporary shoo-fly or detour for the railroad during construction of the grade separation.

6.3 CRITERIA AND CONDITIONS FOR IMPLEMENTATION OF FRONTAGE ROADS

Frontage roads are appropriate in rural areas to segregate high-speed, long-distance traffic from lower speed, local traffic and to reduce the number of conflict points along the SRA.

The general criteria and conditions for implementation of frontage roads along rural SRA routes are shown below. One or more of the conditions should apply and all of the criteria should be met before a frontage road is constructed.

Conditions

Closely Spaced Driveways Road segments including groups of businesses or residences and significant numbers of driveways or curb cuts are candidates for frontage roads.

Groupings of Potentially Dangerous Intersections Segments with a number of intersections likely to experience accident problems due to sight distance restrictions, grades, or offsets should also be considered for frontage roads.

Criteria

Adequate Right-of-Way Between intersections, the total SRA right-of-way with frontage roads should be 260 to 284 feet. At intersections, the minimum right-of-way should be 400 feet to allow the frontage road to taper away from the intersection. A separate intersection is created by the cross-street and the frontage road to insure adequate space for design of turning bays, and for signal coordination (if applicable).

Two-way Operation with Access at Cross-Streets In rural areas where cross-streets are not regularly spaced, two-way operation will minimize indirect routing of local trips. By providing access to the SRA only at cross-streets, potential accident hazards associated with slip ramps are avoided.

Continuity The frontage road should have the capability of being continuous for a distance of at least three miles and terminate at cross-streets. It should serve several activity centers and cross-streets along the SRA.

6.4 TYPICAL ENVIRONMENTAL CONSIDERATIONS

The environmental analysis component of the SRA planning process is primarily an inventory of existing conditions. The purpose of the inventory is to identify those environmental characteristics which may not be compatible with potential roadway improvements or an increase in traffic volumes. Detailed environmental assessments will be performed when SRA route recommendations move into preliminary design engineering.

Each route type can be expected to provide slightly different environmental concerns. Environmental considerations important to rural route types are likely to include, at a minimum, land uses that:

- Are sensitive to noise: residential, schools; and
- Are gathering places for children: schools, parks.

Other environmental concerns include but not limited to:

- Public open space, parks and recreation areas, scenic areas and designated natural areas, nature preserves, historic areas, sites, and structures and floodplains,
- Unsuitable lands: unstable soils and prime agricultural lands,
- Publicly-owned properties,
- Air quality,
- Hazardous materials,
- Cemeteries,
- Rivers, streams and wetlands
- Threatened and endangered species and their wildlife habitat,
- Sight screening,
- Effects of roadway lighting on existing light canopy,
- Drainage,
- Water quality,
- Tree preservation,
- Agricultural preservation,
- Visual/Aesthetic impact.

CHAPTER 7
URBAN SRA ROUTES

7.1 TRANSIT

Techniques associated with mass transit which may be applicable in certain urban situations are described below. All measures are supportive of bus and/or rail service and are consistent with the objectives of the SRA system.

7.1.1 Light Rail Systems

On selected arterials, where development densities would support them, construction of light rail lines may be considered. At the present time the City of Chicago is planning a light rail system serving the Chicago central area; segments of this system may be located in the Ohio/Ontario corridor. In selected urban corridors which have been identified in the 2010 Transportation System Plan, implementation of light rail lines may be appropriate later in the twenty-year planning period. Reserving rights-of-way would allow preservation of the option of light rail system implementation.

7.1.2 Circulator and Shuttle Services

These services provide connections between office buildings, retail centers, social services, residential developments and other major trip generators, and may be operated by either the public or the private sector. Within the urban environment, the typical application would be to have buses serve an area with several large activity centers, such as office complexes, medical facilities, apartment buildings, universities or portions of the Central Business District. Shuttles may also connect transit facilities to employment and other activity centers. For example, Diversified Regional Centers as proposed for consideration in the NIPC Strategic Plan for Land Resource Management would be appropriate locations for circulator and shuttle services.

7.1.3 Ridesharing

Carpools and vanpools are the most common forms of ridesharing. Carpools are frequently privately organized, but employers sometimes sponsor vanpools. In Northeastern Illinois, CATS and the Regional Transportation Authority assist with the organization and start-up costs of vanpools. On request, CATS also provides assistance in identifying carpool participants. Marketing and financial support for van and carpooling programs are strategies which complement the SRA program in general, and in selected major activity areas, can have a significant effect on traffic congestion.

7.1.4 High Occupancy Vehicle (HOV) Lanes

Section 4.4 discusses the criteria and conditions that should exist before High Occupancy Vehicle (HOV) treatments are to be considered. Where criteria and conditions can be met on urban SRA routes, provision of HOV lanes should be considered in the specific route configuration. Examples of the application of HOV lanes are shown in *Figure 7.1* and *Figure 7.2*. If the median bus lane treatment shown in Figure 7.2 is proposed, automobile left turns from the urban SRA route should be permitted only at other SRA routes.

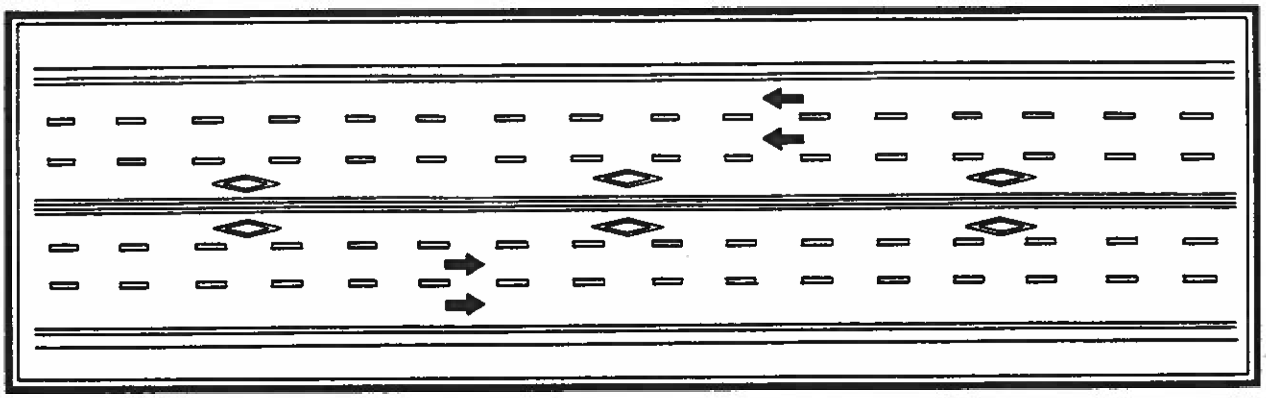


Figure 7.1 HOV Lane Application

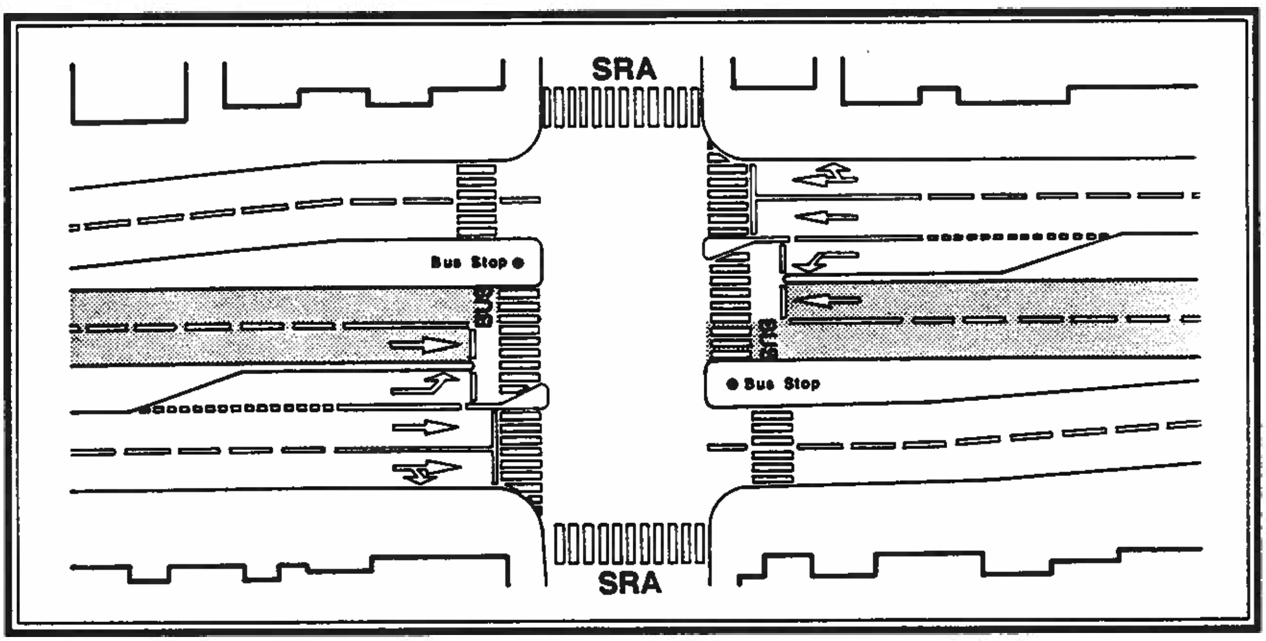


Figure 7.2 Center Bus Lane Treatment

7.1.5 Transit Contra-Flow Lanes

Lanes on urban SRA facilities could be dedicated to transit vehicles which travel in the reverse direction from the normal traffic flow. See *Figure 7.3* for an example of a typical transit contra-flow lane. Contra-flow lanes have been used in downtown Chicago, and have been very effective in reducing both bus travel times and bus operating expenses. Difficulties can occur in educating the public as to how they work so that accidents can be prevented, in segregating the lanes, and in signing. Because of accident potential, transit contra-flow lanes are not generally recommended. A physical barrier to separate the bus lane from the sidewalk may be necessary. This design option should, nevertheless, be considered to improve transit travel times on urban SRA routes where additional lanes cannot be easily added because of space limitations and reserve capacity is available in the non-peak direction.

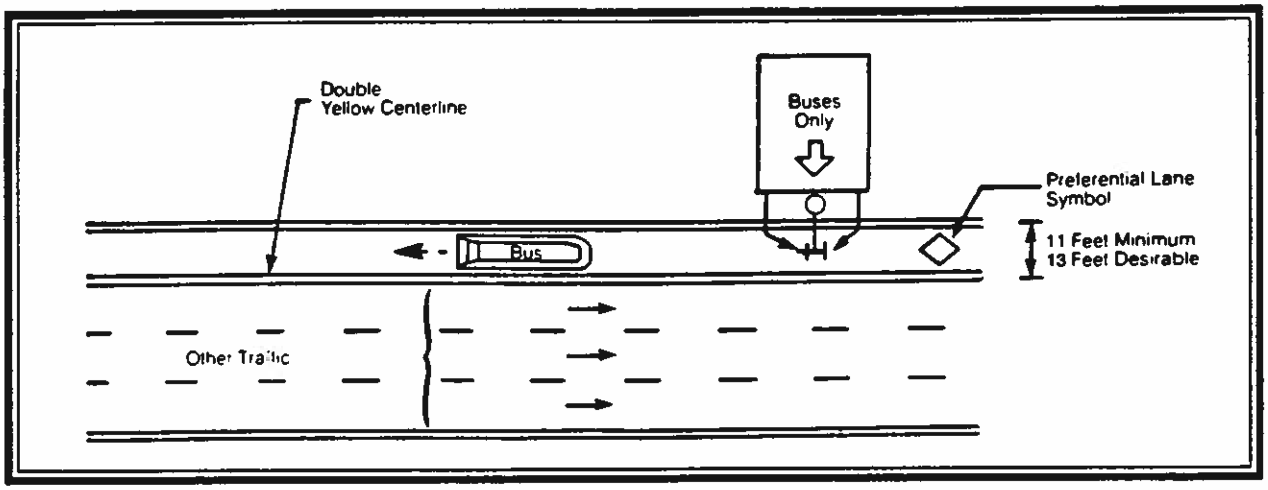


Figure 7.3 Typical Transit Contra-Flow Lane

7.1.6 Passenger Facilities

Passenger facilities, which make it easier and safer to use transit while minimizing SRA congestion, should be provided. Ideally, these facilities are constructed in proximity to, but off of the major arterial. They include sheltered facilities where riders can transfer among bus and rail services, as well as between personal autos and transit. These facilities offer comfort, convenience and safety. Sidewalks should be built along the roads to complement transit facilities, including bus stops, and to connect them with commercial, retail and residential complexes.

7.1.7 Signal and Intersection Improvements

Signal and intersection improvements which benefit transit should be considered in appropriate situations. Signal preemption capability for transit vehicles is an important amenity. This capability would permit transit vehicles to speed their flow through traffic, reducing travel time and increasing potential for transit use. Signal preemption should only be activated to keep buses on schedule.

7.1.8 Improved Transit Station Accessibility

Improved transit station accessibility concepts are discussed in detail in Section 8.1.8.

7.1.9 Transit Signage

A sign system should be developed for public transportation that is consistent with the overall signage plan for the SRA system. The creation of such a sign system would guide motorists along the SRA routes to transit facilities, warn of possible train and pedestrian traffic ahead, and heighten public awareness of alternate modes of transportation.

7.2 ROADWAY OPERATIONS

7.2.1 Intersections

In urban locations where an SRA route intersects with another SRA or major intersection, unmarked pavement areas often exist. These areas often leave much to the discretion of the driver. Channelization and traffic islands can be used at these locations to guide motorists, reducing confusion and conflicts. When properly designed, channelization can also increase intersection capacity.

Traffic islands can also provide pedestrian refuge at wide urban intersections. When used as pedestrian refuge areas, islands must be of sufficient size and protected by a raised median curb.

An example of using channelization on an urban SRA is shown in *Figure 7.4*.

Reconstruction of offset intersections can also improve traffic operation where cross-street traffic is forced onto the SRA rather than using a single intersection. Elimination of offsets at signalized locations can reduce the traffic flow on the SRA route.

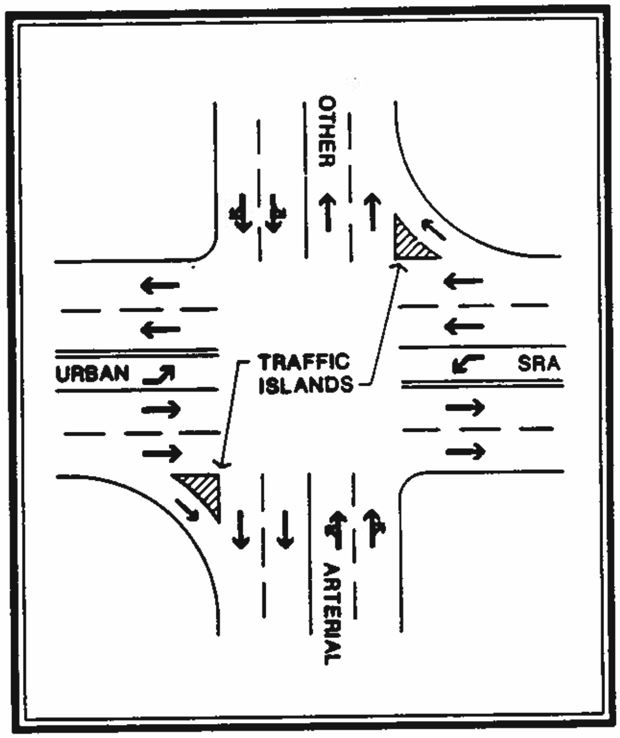


Figure 7.4 Channelization Islands

7.2.2 Driver Information Systems

In addition to providing signs and pavement markings to guide motorists, providing motorist information on congestion, construction, or other incidents which may affect their trips is increasingly important.

Driver information systems may include variable or fixed message signing, radio and television traffic reports, newspaper articles, and brochures. Newspaper articles and brochures work well for long-term construction projects where maps of the area and alternative routes can be provided to the public. Radio and television can be helpful in warning drivers of congestion, accidents or short-term maintenance and possibly providing alternate routes. Variable message signs can be used for both long-term and short- term information, provided the message board can be changed conveniently and from a remote location. In the Chicago area drivers can call *999 to report information on current traffic conditions on the Chicagoland expressways.

These more traditional approaches to driver information systems have been used extensively throughout the United States. However, the following ideas could be employed to improve the systems and apply them to the SRA system as well as the expressway system:

- Expand the current coverage of the radio traffic reports and changeable message signs to include SRA routes.

- Establish a clearinghouse for obtaining and distributing information on traffic conditions to the proper locations.

- Continue to explore new incident detection methods as well as methods for distributing the information to motorists. As new technologies are developed and are proven effective they could be employed on the SRA system.

The future of driver information systems is "smart" cars and "smart" roads. The idea behind smart cars is that an on-board computer would receive information concerning traffic conditions, alert the motorist and recommend a course of action. There have been several different types of "smart" car ideas ranging from an on-board computer map system to aid the driver, to systems which can receive the destination from the driver and combine this with updated traffic conditions to choose the shortest route. Several prototype smart cars have been tested throughout the world.

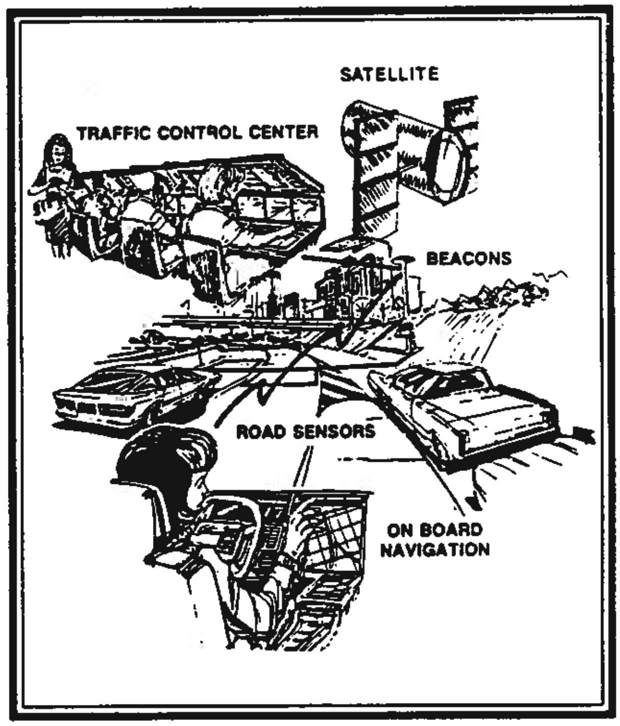


Figure 7.5 Driver Information Systems

In Illinois, the feasibility of a demonstration project is being studied by the Illinois Department of Transportation. This project is the largest of its kind to date. It could include 2000 to 5000 cars equipped with computerized displays which would inform drivers of congestion and alternate routes. The decision to proceed with this project could be readied as soon as 1991. *Figure 7.5* shows the components of an advanced driver information system.

7.2.3 Advance Signal Interconnect Methods

Presently, signals are interconnected by time base coordination, 7-wire hardwire and twisted pair wiring. In some cases, signals are interconnected by lines leased from telephone or cable TV companies. A communication wire is often a vulnerable link in a signal system. Wires are sometimes inadvertently cut by maintenance work and construction, disrupting signal progression. Recently, advances have been made in the way traffic signals are interconnected to achieve coordination. New methods include radio, coaxial cable, and fiber optics.

Radio interconnection has the advantage of eliminating any interconnect wiring and the expense of conduit installation on an existing street. This would prove most beneficial in urban areas where interconnecting signals may be limited by the inability to install conduit or overhead wire.

Coaxial cable interconnection methods have the ability to transmit video for surveillance and control of signal systems. Fiber optics is an excellent communications carrier with multi-channel capability. However, coaxial cable and fiber optics both require special technical knowledge for installation and maintenance. These new methods of signal interconnection can provide additional capabilities such as transmitting video which could be used in conjunction with driver information systems.

The selection of an interconnect method should include an evaluation of reliability, maintenance and desired uses.

7.2.4 Left Turn Lagging Signal Phase

The use of a lagging left turn signal phase (e.g. the left turn phase comes after the through phase) can improve synchronization. Progression bandwidths, which controls time available during which all cars can progress through a series of signals, can be increased with lagging left turn phasing.

This type of phasing should only be allowed at T-intersections or intersections allowing left turns only on the protected phase. The lagging left turn should not be used in conjunction with a left turn yield on green for opposing traffic flows.

7.2.5 One-Way Arterial Pairs

One-way arterial pairs can dramatically increase the capacity of a roadway by reducing turning movements and conflicts. The one-way pairs should be within close proximity of each other, and therefore, this concept would be most feasible in urban areas where right-of-way for capacity increasing improvements is limited, and where closely-spaced parallel streets are available. An example of this concept is shown in *Figure 7.6*.

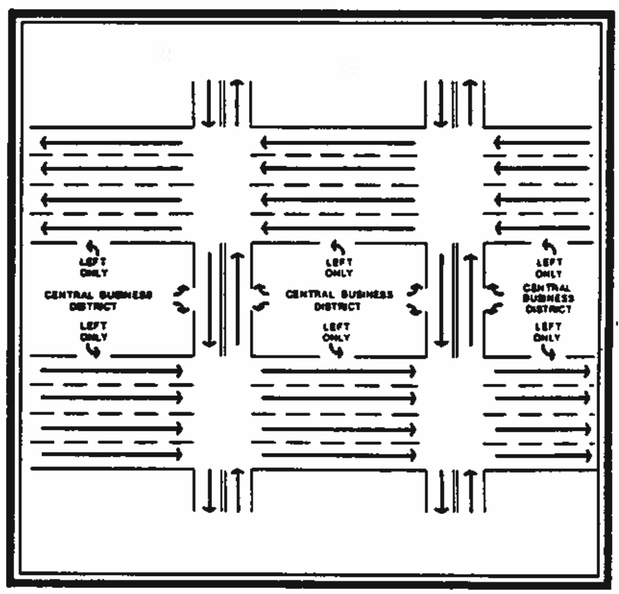


Figure 7.6 One-Way Arterial Pairs

7.2.6 Reversible Lanes

In areas where there is a substantial amount of commuter traffic, and a directional bias to the traffic corresponding to the time of day, reversible lanes could be considered.

Using lane control signals in combination with signing, the direction of flow could change in areas where capacity is limited and directional flows exist. A specific example of the use of this technique is Ridge and Hollywood Avenues from Peterson Avenue to Lake Shore Drive, which uses three eastbound lanes during the morning rush hour (one westbound) and three westbound lanes in the afternoon (one eastbound). Lane control signals are used in combination with road cones to alert drivers to the current lane usage. *Figure 7.7* shows this section of roadway during the morning peak period.

Figure 7.7 Ridge Avenue Reversible Lanes

This technique would be most useful on urban SRA routes where right-of-way is limited and other capacity increasing techniques are not feasible.

7.2.7 Left Turn Restrictions

At intersections where capacity is limited and volumes are high, left turn restrictions and elimination of signalized turn phases may be necessary. This will increase capacity on the SRA and reduce intersection conflicts. Alternative routes or access will be required for the affected movements.

In some instances limiting left turn movements to off-peak periods on an urban SRA route can be beneficial to roadway operations. This alternative is particularly adaptable in locations where turn lanes are not available because one turning vehicle can effectively reduce the the SRA capacity by one-half if only two through lanes are present.

7.3 ROADWAY DESIGN FEATURES

7.3.1 Grade Separations

Capacity and safety on the urban SRA route is at the highest level when the SRA is grade separated from intersecting cross streets and railroads. Limited right-of-way and economic considerations of construction cost restrict the use of grade separations to special locations. Protection of sufficient right-of-way is critical wherever a grade separation is recommended. The design of the grade separation and corresponding right-of-way requirements are based on the design criteria in *Table 4.2* in Chapter 4.

7.3.2 Interchanges

Conventional intersection widening and signalization techniques may not provide sufficient capacity at every SRA intersection. An urban SRA intersection projected to operate at a peak hour level of service E or F in year 2010 with conventional improvements will be the basic criteria for interchange evaluation.

Insufficient right-of-way in the urban environment represents the greatest impediment to the feasibility of interchange construction. For this reason, other criteria such as the elimination of spot congestion and hazards do not represent adequate and cost effective criteria for interchange construction in the urban environment.

Because of right-of-way limitations, the single point (urban) diamond interchange or the compressed diamond interchange as shown on *Figure 7.8* and *Figure 7.9*, are the recommended interchange types for urban SRA routes. The construction of either interchange type is limited to the area within the existing right-of-way at most urban intersections. The single point diamond requires less right-of-way than the compressed diamond and provides more capacity in most cases. The urban diamond may provide more efficient storage of left turn vehicles on the cross road compared to the compressed diamond. However, the compressed diamond may be more applicable in urban areas because of the existing access requirements at intersection corners. Access can be permitted onto the interchange ramps near the cross street. The applicability of each type should be evaluated at each location. The SRA must receive the grade separated through movement priority for interchanges with cross streets of lower classification and volume.

Where an interchange is proposed at the intersection of two urban SRA routes, the route that is designated for grade separated through movement priority should be determined by which route is projected to carry the heavier traffic volume. Certain geometric, right-of-way and access requirements, however, may mandate that the other SRA route receive the grade separated through movement priority.

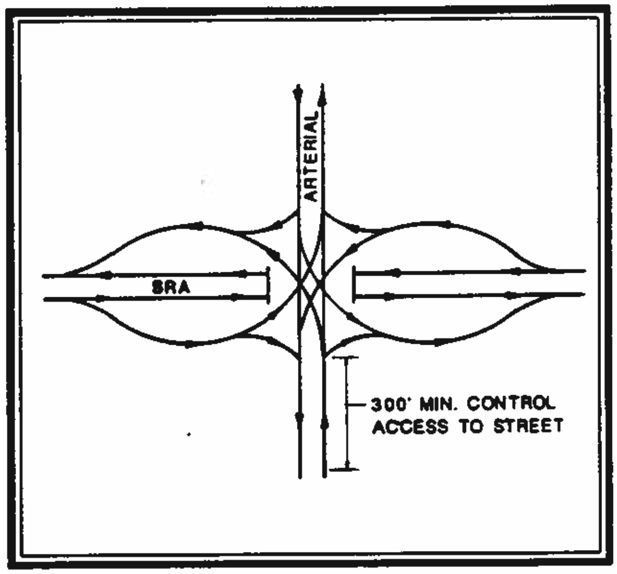


Figure 7.8 ***Single Point (Urban) Diamond Interchanges***

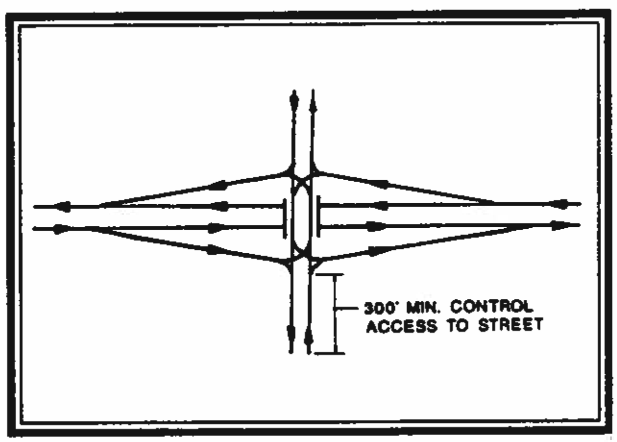


Figure 7.9 ***Compressed Diamond Interchanges***

A U-turn movement could be added to a diamond interchange between an urban SRA and a lower class/volume cross-street. The underpass U-turn would allow SRA users to access an opposing frontage road without having to pass through signalized intersections on the cross streets (See *Figure 7.10*).

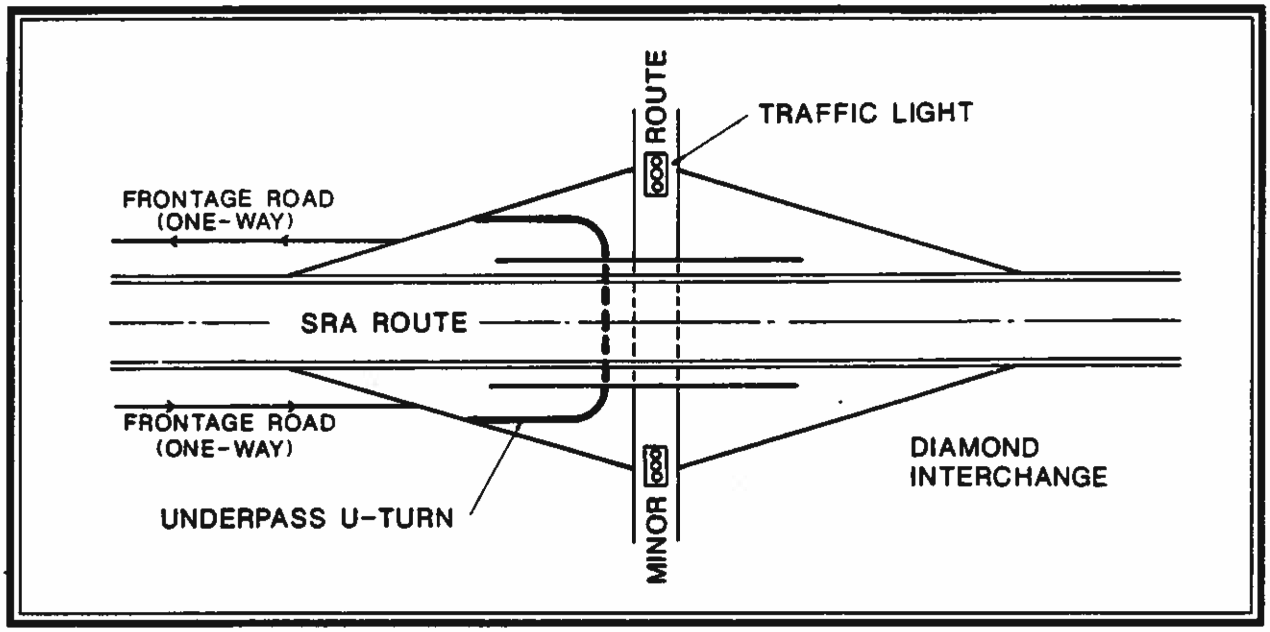


Figure 7.10 Underpass U-Turn

7.3.3 Existing Interchanges with Expressway/Tollway System

Each existing interchange between an urban SRA route and the metropolitan Chicago expressway/ tollway system should be evaluated in the SRA planning process. Some existing interchanges are of the half diamond or partial cloverleaf design which permit access to the expressways from the urban SRA routes in one direction only (usually oriented towards the Chicago Loop). Traffic conditions and directional flows that existed when these interchanges were initially constructed have changed significantly in some cases. Consequently, the absence of some directional movements at the interchanges may be detrimental to arterial and/or expressway traffic by forcing longer trips through circuitous routing.

It is recommended that existing interchanges that do not provide all directional movements be evaluated for potential to add those movements. Ramp types that may be considered include direct "diamond interchange" ramps in restricted right-of-way areas or "cloverleaf" type ramps if adequate right-of-way is available. Before a final recommendation is made regarding the additional ramps, however, the impact of ramp additions must be evaluated for its effect on the expressway. Expressway interchange/ ramp spacing, capacity and safety should be factors considered. If studies indicate that the level of service on the expressway would be lessened with the addition of the ramps, then they should not be proposed.

Other improvements that may be considered at existing interchanges with the expressway/tollway system include widening the SRA structure over the expressway, lengthening storage bays for left turning vehicles from the SRA to the ramp, construction of separate right turn lanes and interconnection of traffic signals to promote progression along the urban SRA route.

7.3.4 Restrictive Right-of-Way

It is recognized that certain urban SRA routes consist of a 66 foot right-of-way with no building setbacks for existing development. It may not be feasible to obtain additional right-of-way required for expansion into the desirable urban SRA roadway cross section at these locations (See *Figure 4.1*).

In these restrictive right-of-way locations, it is recommended that emphasis be placed upon the implementation of two through lanes in each direction, allowance of left turns from the SRA only at major intersections and the consolidation or control of intermittent access points. Other applicable techniques include permanent on-street loading restrictions and designation of an alternate freight route onto a parallel facility.

7.3.5 Major Projects/Corridors of the Future

The 2010 Transportation System Development Plan recommends eight future major expressway projects and six future major transit projects and identifies six major expressway corridors of the future and seven major transit corridors of the future. SRA roadway design should make special allowances, such as flexible designs and additional right-of-way, at intersecting points and parallel facilities for these future major projects/corridors of the future.

7.3.6 Commencement/Terminus of Urban SRA Routes

The commencement/terminus points of urban SRA routes may require changes in roadway cross-sections, such as a reduction in the total number of lanes, elimination of channelized median treatment or change in posted speed. Tapers or transitions should be provided in these instances to avoid abrupt and unsafe cross-section changes and provide smooth transitions.

7.4 ACCESS AND RIGHT-OF-WAY

7.4.1 Access Management

Length of travel time and driver safety are affected by the number and configuration of access points to the SRA. Each driveway and cross street adds to congestion and increases the likelihood of accidents. Where these problems are particularly serious, the following techniques may improve traffic flow without seriously inconveniencing access and cross traffic.

7.4.1.1 Eliminate Local Street Access

The intersection hazards and congestion at some low volume local streets could be eliminated by terminating or rerouting the street prior to its intersection with the urban SRA. The typical urban street pattern of 8 to 12 streets per mile makes this alternative feasible. Increased capacity would result on the urban SRA route. The impact of this alternative must be evaluated prior to its implementation to assess local traffic patterns, land use impacts and its effect on emergency vehicle response times. Streets which serve as collectors should not be considered for elimination of access to the SRA. While streets can be closed to motorists, access should be maintained for pedestrians and bicycles.

Where the cross streets are wide enough, they could be converted into mini-parking lots where parking would be compatible with nearby land uses. Alleys could be used for deliveries and access to on-site rear parking where available. Additional directional signage would aid motorists in finding parking convenient to their destination.

7.4.2 Right-Of-Way Protection

7.4.2.1 Less Than Fee Simple Acquisition

Acquiring only the rights to the land that are needed to accommodate particular users can reduce cost and environmental impact. Full possession of land is made of many rights including rights to use the surface, subsurface, and air space and access to the land. In some cases, acquisition of only one of these rights would be adequate to relocate one or more right-of-way users.

Use of subsurface rights is common in the Chicago central area. Mass transit, streets, and pedestrian ways honeycomb the subterranean landscape. Pedestrian use of public open spaces and pedestrian ways connecting parallel streets are common. New applications could include surface rights-of-way for pedestrian ways, transit stops, and alley improvements. Air and subsurface rights would remain with the landowner (see *Figure 7.11*).

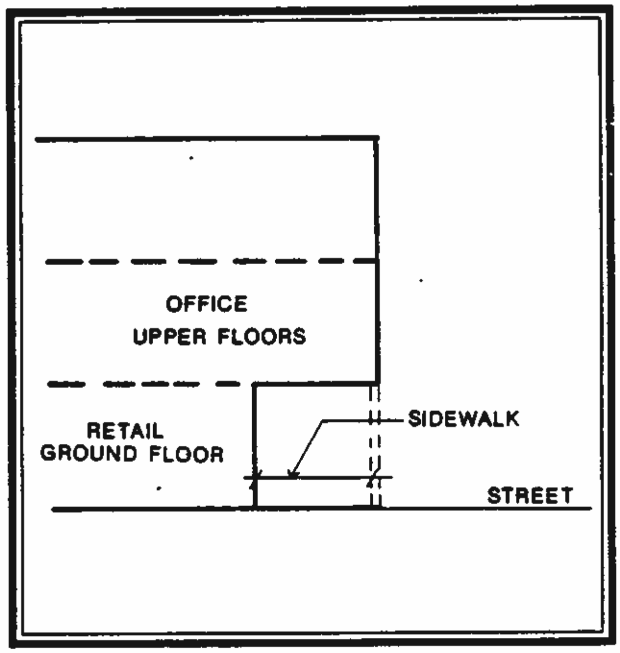


Figure 7.11 Surface Rights Easement

7.4.2.2 Alley Maintenance and Improvement Agreements

Along many segments of urban SRA routes, buildings are separated from the lanes of traffic by only a sidewalk and parking. In these situations, improvement and maintenance of existing alleys can provide some alternatives for certain uses, such as off-street loading.

Alleys are the hallmarks of early, grid-like subdivision practice (see *Figure 7.12*). They can be as much as thirty feet wide and most are at least half that. Access to the rear of buildings, particularly for service traffic, is certainly possible. Many property owners already use the alley for access. Improvements to encourage greater use of these often ignored pathways would lend to better maintenance and more regular supervision.

7.4.2.3 Acquisition of Out-Holdings

Some segments of the SRA network were developed so that older homes and commercial development intrude into the otherwise standard right-of-way causing short bottlenecks. Developed intersections may also have less right-of-way than is necessary to make needed improvements. Purchase of these properties is one method of bringing these segments into conformity (see *Figure 7.13*).

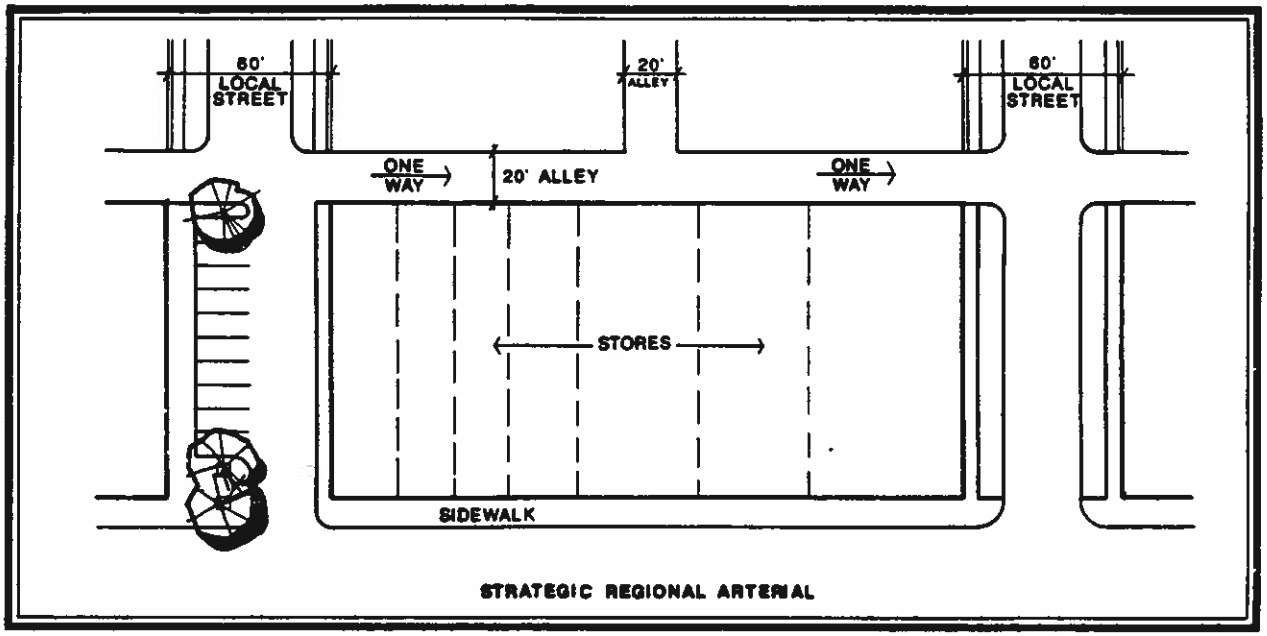


Figure 7.12 Alley Development

7.4.2.4 Right-of-Way Substitution

Some communities value existing land uses over transportation needs. In some instances, it may be preferable to relocate one or more segments of the SRA over expanding the existing roadway. If a portion of the route is relocated, the implementing agency could assume responsibility for maintenance of the new segment, while the local government would assume maintenance of the existing roadway.

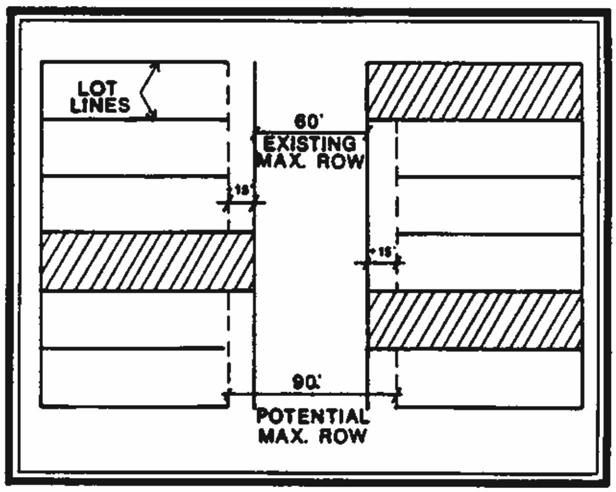


Figure 7.13 Out-Holdings

7.4.2.5 Supplementary Corridors

In all areas of the region there are unused or underused rail beds, rivers, and canals that offer many miles of unobstructed right-of-way. Their expanded use or adaptive reuse could provide much needed supplements to existing routes. Compatibility with the adopted NIPC Regional Greenway Plan will be addressed. Plans for redevelopment of railroad rights-of-way could reserve enough corridor to provide a throughway for possible future transit or freight.

7.4.2.6 Partial Purchase and Site Rehabilitation

The object of this strategy is to acquire enough of a site as is needed for the right-of-way and to make repairs or build facilities to restore the property to its original function. Examples might include parking spaces and corner businesses. Parking spaces can be rebuilt, if there is space elsewhere on the parcel. Corner commercial enterprises can be moved or rebuilt.

7.5 FREIGHT

7.5.1 Vertical Clearance Improvements

The need and methods to improve structural vertical clearances on urban SRA routes have been discussed in Section 2, Recommended Designs and Features, Chapter 4. The recommended vertical clearance standard for urban SRA routes is 14 feet - 6 inches. If the methods for improving structural vertical clearances are judged not feasible at a particular structure, then designating an alternate freight route around the structure may be a realistic option.

7.5.2 Turning Radius Improvements

Insufficient turning radii for freight vehicles at intersections on urban SRA routes negatively affects traffic capacity because it takes much longer for the freight vehicle to make the turn. It is desirable that the turning radii at SRA to SRA urban intersections be capable of accommodating the WB-50 design vehicle without encroachment into oncoming traffic.

Turning radii improvements should not be indiscriminately applied. In urban areas there are frequently heavy pedestrian volumes and shallow setbacks for buildings. Turning radii improvements should only be proposed after it is ascertained that the existing sidewalk widths or adequate pedestrian capacity can be maintained.

7.5.3 Loading Zones

When there is no opportunity for any off-street options, the impact of on-street loading can be minimized. Specifically this would include the elimination of on-street parking on the SRA and the installation of loading zones in the curb lane. These zones should have restrictive hours so that they are used only in off-peak periods. The zones should be located so that right-turning traffic can use the curb-lane at intersections. *Figure 7.14* presents a typical arrangement of on-street loading zones.

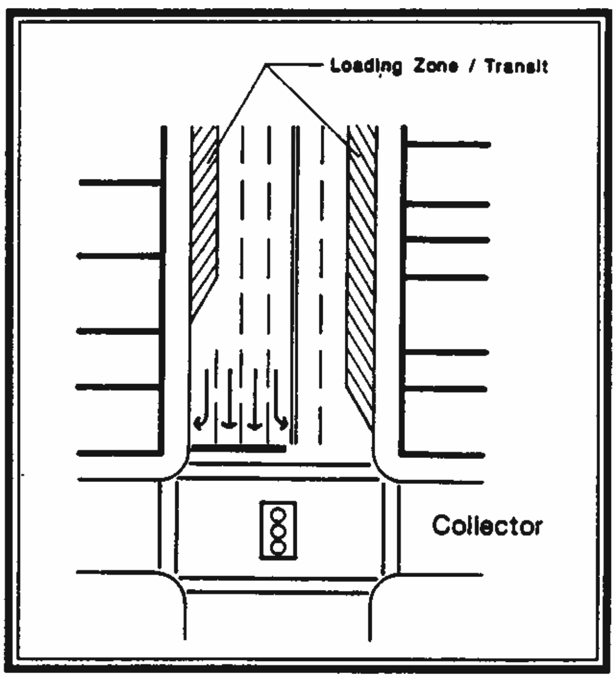


Figure 7.14 Typical Treatments for On-Street Truck Loading Zones

It may be possible to serve the loading needs of some properties by improving alley space for access by delivery vehicles. Service and freight vehicles could exit the SRA on either a collector or local street and enter the alley behind the building to which the delivery will be made. Loading and unloading should have a time restriction in alleys that are too narrow for two vehicles to pass one another. One-way alley operation may also be considered to reduce delivery vehicle conflicts.

Another option is to move the loading zone to a local side street. In this situation, parking would be prohibited and loading bays would be created using a part of the sidewalk area. Such a treatment should only be considered where pedestrian traffic is relatively low and alleys are not present. *Figure 7.15* presents typical treatment for local street loading.

Where unused land is available, a central loading area in the middle of a block and behind the buildings could be developed. While large delivery vehicles probably could not use such a facility, since the area would be too small for maneuvering space, small dual-axle vehicles could use it. *Figure 7.16* displays this concept.

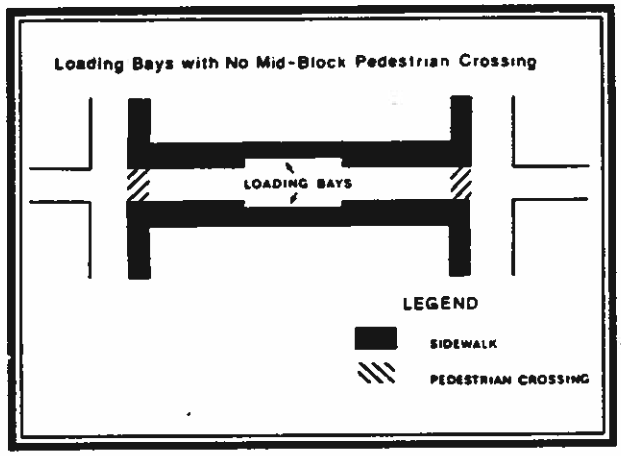


Figure 7.15 On-Street Truck Loading Bays

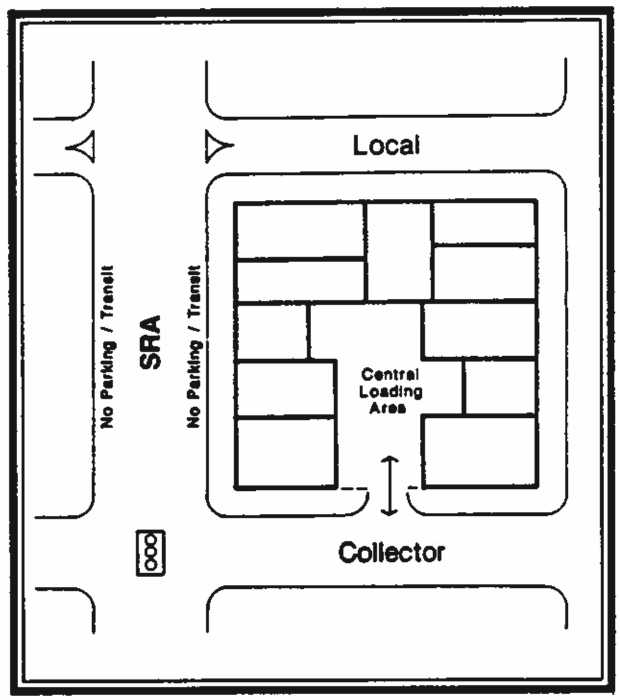


Figure 7.16 Central Loading Area

7.5.4 Alternate Freight Routes

Alternate freight routes on urban SRA routes should be considered when there are inherent capacity restraining features such as inadequate number of through traffic and turn lanes, insufficient vertical clearance for a structure or series of structures, substandard turning radii at intersections, or where surrounding land use patterns make freight delivery a non-essential element.

Alternate freight routes should be designated on roadways parallel to the urban SRA which do not cause a great deviation from the route of travel and should be clearly signed to indicate the alternate route.

CHAPTER 8
SUBURBAN SRA ROUTES

8.1 TRANSIT

Techniques associated with mass transit which may be applicable in certain suburban situations are described below. All measures are supportive of bus and/or rail service and are considered with the objectives of the SRA system.

8.1.1 Light Rail Systems and Busways

On selected arterials, where development densities would support them, construction of light rail lines and busways may be considered. In selected suburban corridors which have been identified in the 2010 Transportation System Plan, implementation of light rail lines and busways may be appropriate later in the twenty-year planning period. Reserving rights-of-way would allow preservation of the option of these light rail system and busway projects.

8.1.2 Circulator and Shuttle Services

These services provide connections between office buildings, retail centers, social services, residential developments and other major generators, and may be operated by either the public or the private sector. Within the suburban environment, the typical application would be to have buses serve an area with several large activity centers, such as office complexes or shopping malls. Shuttles may also connect transit facilities to employment and other activity centers.

8.1.3 Ridesharing

Carpools and vanpools are the most common forms of ridesharing. Carpools are frequently privately organized, but employers sometimes sponsor vanpools. In Northeastern Illinois, CATS and the Regional Transportation Authority assist with the organization and start-up costs of vanpool CATS also provides assistance in identifying carpool participants, on request. Marketing and financial support for van and carpooling programs are strategies which complement the SRA program in general, and in selected major activity areas, such as major employment areas, can have a significant effect on traffic congestion.

8.1.4 High Occupancy Vehicle (HOV) Lanes

Where criteria/conditions given in section 5.4 can be met on suburban SRA routes, provision of HOV lanes should be considered in the specific route configuration. Examples of the application of HOV lanes are shown in *Figure 7.1* and *Figure 7.2* in Chapter 7.

8.1.5 Passenger Facilities

See Section 7.1.6 in Chapter 7

8.1.6 Signal and Intersection Improvements

See Section 7.1.7 in Chapter 7

8.1.7 Improved Transit Station Accessibility

Existing transit stations along suburban SRA routes should be evaluated for potential improvements to increase accessibility from the SRA. Increased accessibility may motivate more people to make regional trips utilizing transit thereby reducing the number of vehicles on the SRA. Accessibility could be improved by one or more of the following techniques.

- **Actuated Traffic Signals** - Transit station usage is extremely intensive during peak periods. Incorporating traffic signals with phasing and timings that are responsive to the varying levels of traffic during the day will make transit stations more accessible and reduce delays. If new traffic signals are proposed at transit stations, they should meet the established traffic warrants and spacing of signals criteria.

- **Turn Lanes** - To maximize through traffic movements for vehicles not wishing to access transit stations, channelized right and left turn lanes could be constructed for vehicles turning into transit stations. If demand is high enough, dual left and/or right turn lanes could be constructed. Appropriate storage bays for turning vehicles must also be implemented.

- **Parking Improvements** - Parking lot expansion for commuters should be investigated. If a potential expanded parking lot site is judged too far from the transit station, then parking in this area could be free or at a greatly reduced rate to encourage use. Another option is to provide satellite lots with free shuttle buses to the stations. Also, preferential parking stalls nearest to transit stations could be designated for High Occupancy Vehicle. Secure bicycle parking should be provided at most suburban transit stations.

- **Pedestrian Grade Separations** - If substantial parking for a transit station is located on the opposite side of an SRA, grade separation for the pedestrian movement could be considered. This would tend to reduce delays on the SRA caused by at-grade pedestrian flow, and would also improve safety and convenience for the pedestrians.

8.1.8 Transit Signage

See Section 7.1.9 in Chapter 7

8.2 ROADWAY OPERATIONS

8.2.1 Intersections

On suburban routes, intersections with more than four approaches often cause many operational problems. Excess approaches can be removed by closing the approach, by conversion to one-way traffic movement away from the intersection, or using extremely short signal timings to reduce the desirability of the approach. It is recommended that intersections with more than four approaches be reconfigured to remove the excess approaches away from the intersection.

In suburban locations, where the recommended cross-section of dual left turns, three through lanes and separate right turn lane is developed at major intersections, channelization and islands could be used to direct the flow of vehicles. Channelization and islands would be most effective at wide intersections where excess pavement exists leaving much to the discretion of the driver. When properly designed, channelization can increase intersection capacity and reduce conflicts.

Channelization can also be effective at intersections where approaches are not at 90 degree angles. At these locations channelization and islands can guide motorists through the usual turning movements which are often required.

An example of using channelizing islands on a suburban SRA is shown in *Figure 8.1*.

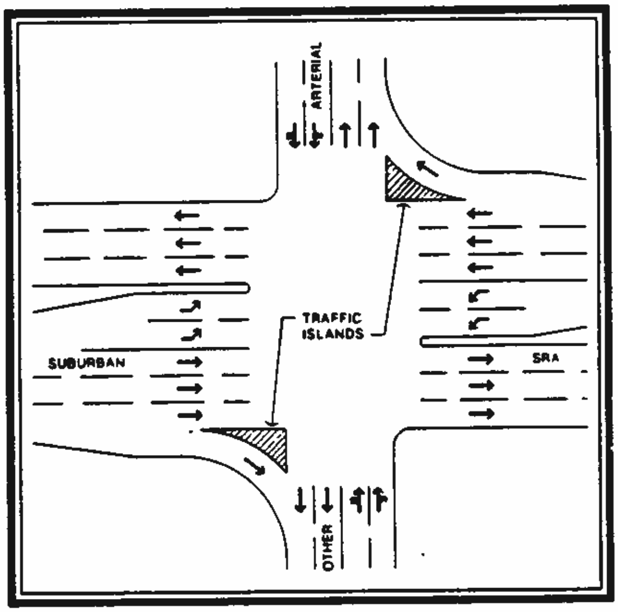


Figure 8.1 Channelization Islands

8.2.2 Intersection Lighting

All suburban SRA to SRA route intersections should have appropriate intersection lighting.

8.2.3 Overhead Signing

All suburban SRA to SRA route intersections should have advance overhead signing with route numbers and/or road names and, where appropriate, regional destinations indicated.

8.2.4 Driver Information Systems

Driver information systems could also be applied to suburban SRA routes; typical systems are described in Section 7.2.2 in Chapter 7. Ideally, one system should be developed to cover all the SRA routes and operate in cooperation with any existing or future Freeway Information Systems.

8.2.5 Advanced Signal Interconnect Methods

The same advanced signal interconnect methods described in Section 7.2.3 in Chapter 7 could also be applied to the suburban SRA routes.

8.2.6 Left Turn Lagging Signal Phasing

Left turn lagging operation as described in Section 7.2.4 in Chapter 7 could also be applied to signal systems on suburban SRA routes. The same effect of increasing progression bandwidths could be experienced. This type of phasing should only be allowed at T-intersections: the left turn lag should not be used in conjunction with a left turn yield on green for opposing traffic flows.

8.2.7 U-Turns and U-Turn Crossovers

U-turns performed from left turn lanes at signalized intersections can provide access to both sides of the roadway while limiting crossing maneuvers at midblock locations. This can be accomplished by construction of a raised median curb. Intersection timing must be adjusted to allow for the extra left turn signal time.

An alternate strategy is to not allow left turns to be performed at the intersection, but allow a U-turn past the intersection to get to the cross-street. This concept, called a U-turn crossover, has been used on Telegraph Road in Detroit, Michigan. The benefits are increased capacity and simplified intersection phasing. Telegraph Road has been shown to handle in excess of 100,000 vehicles per day on an eight-lane cross-section. An example of this concept is shown in *Figure 8.2*. This concept must be used continuously for a minimum five mile segment and requires a 46 to 60 foot median to assist the U-turning vehicles.

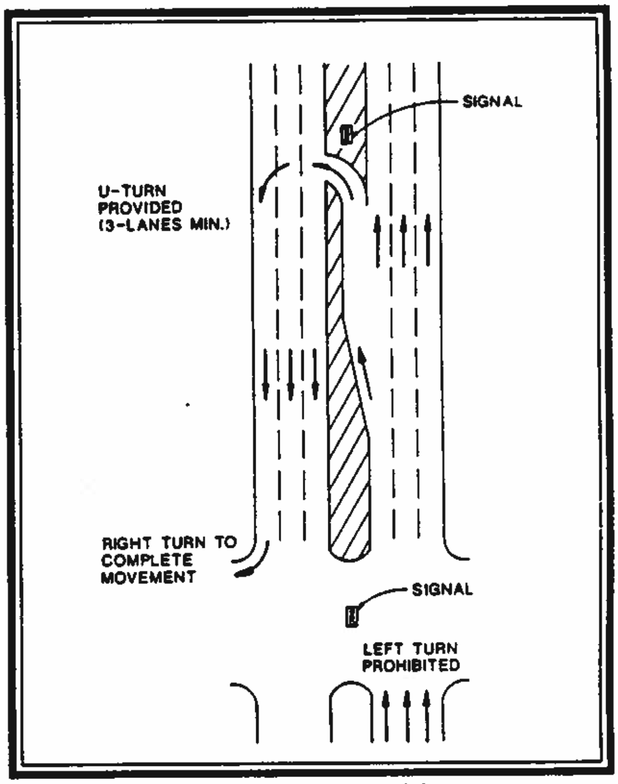


Figure 8.2 Telegraph Road in Detroit, Michigan

8.2.8 Two-Way Left Turn Lanes

In areas where there are numerous access points along a roadway, such as commercial areas, continuous two-way left turn lanes have been shown to increase capacity and reduce conflicts. Two-way left turn lanes should only be used where the speed limit is less than 45 mph and only where there are two through lanes or less in either direction. This type of design could be used in suburban areas where there are numerous access points and where other solutions to control access (frontage roads, access closures, etc.) are not feasible. An example of a two-way left turn lane is show in *Figure 8.3*.

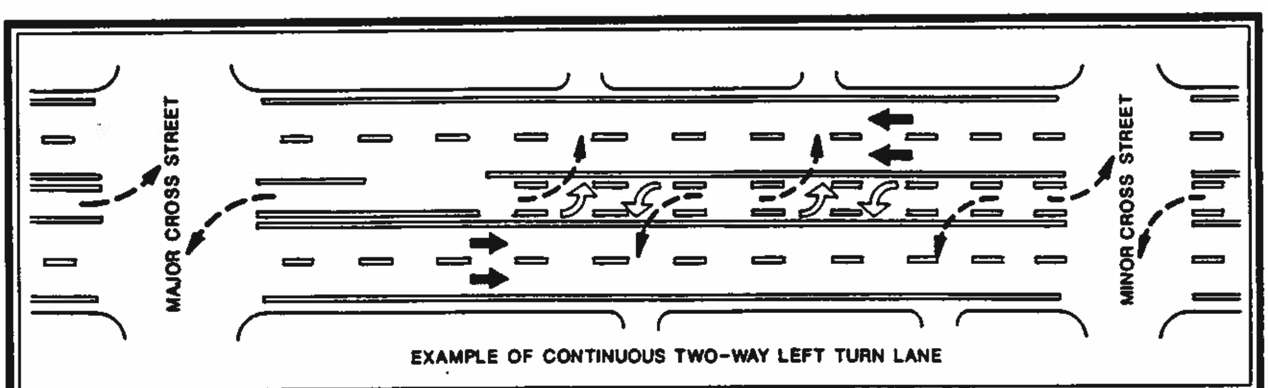


Figure 8.3 Two-Way Left Turn Lanes

8.2.9 Left Turn Restrictions

Left turn restrictions may prove beneficial on suburban routes. The beneficial increase in through traffic capacity caused by limiting left turning movements may offset the effect of increasing travel distances and restriction to access. This is consistent with the SRA goal of accommodating regional trips. Techniques for left turn restrictions are identified in Section 7.2.7 in Chapter 7.

8.2.10 Eliminate Minor Road/Street Access

It is recommended that, where feasible, consideration be given to eliminating access from low volume minor roads and streets to the suburban SRA routes. The feasibility of terminating or rerouting the minor route will depend on variables that include the local street traffic volumes, emergency vehicle response time, and the availability of alternate routes.

8.3 ROADWAY DESIGN FEATURES

8.3.1 Interchanges

The basic criteria for consideration of an interchange will be at suburban SRA intersections that are projected to operate at level of service E or F in year 2010 with conventional improvements. Intersections that operate at level of service D or better are not to be considered as candidates for interchange construction, unless unsafe geometric design features, such as excessive intersection skew, are present.

Suburban SRA routes are frequently characterized by a limited right-of-way availability. Interchange types that require the least amount of right-of-way and therefore considered most appropriate for the suburban SRA routes are the single point (urban) diamond interchange and the compressed diamond.

The single point diamond interchange requires the least amount of right-of-way and has been found to provide more traffic capacity than a conventional diamond interchange. The compressed diamond interchange is more appropriate in situations where access requirements at the intersection corners cannot be eliminated. Access may be permitted onto the interchange ramp, if necessary, near the cross street. When the single point and compressed diamond interchanges are recommended, the SRA must always have the grade separated priority through movement.

Diagrams of these two interchange types are shown on *Figure 7.8* and *Figure 7.9* in Chapter 7. The desirable amount of right-of-way to be protected for both interchange types is indicated on *Figure 8.4*.

For an intersection of two suburban SRA routes, where sufficient right-of-way is available, a cloverleaf interchange design may be considered. The advantage of this interchange type over the diamond interchange is that both intersecting streets have uninterrupted through movements.

A U-turn movement could be added to diamond interchanges between suburban SRAs and lower class/volume cross streets. The underpass U-turn would allow SRA vehicles to access an opposing frontage road without having to pass through signalized intersections on the cross streets (see *Figure 7.10* in Chapter 7).

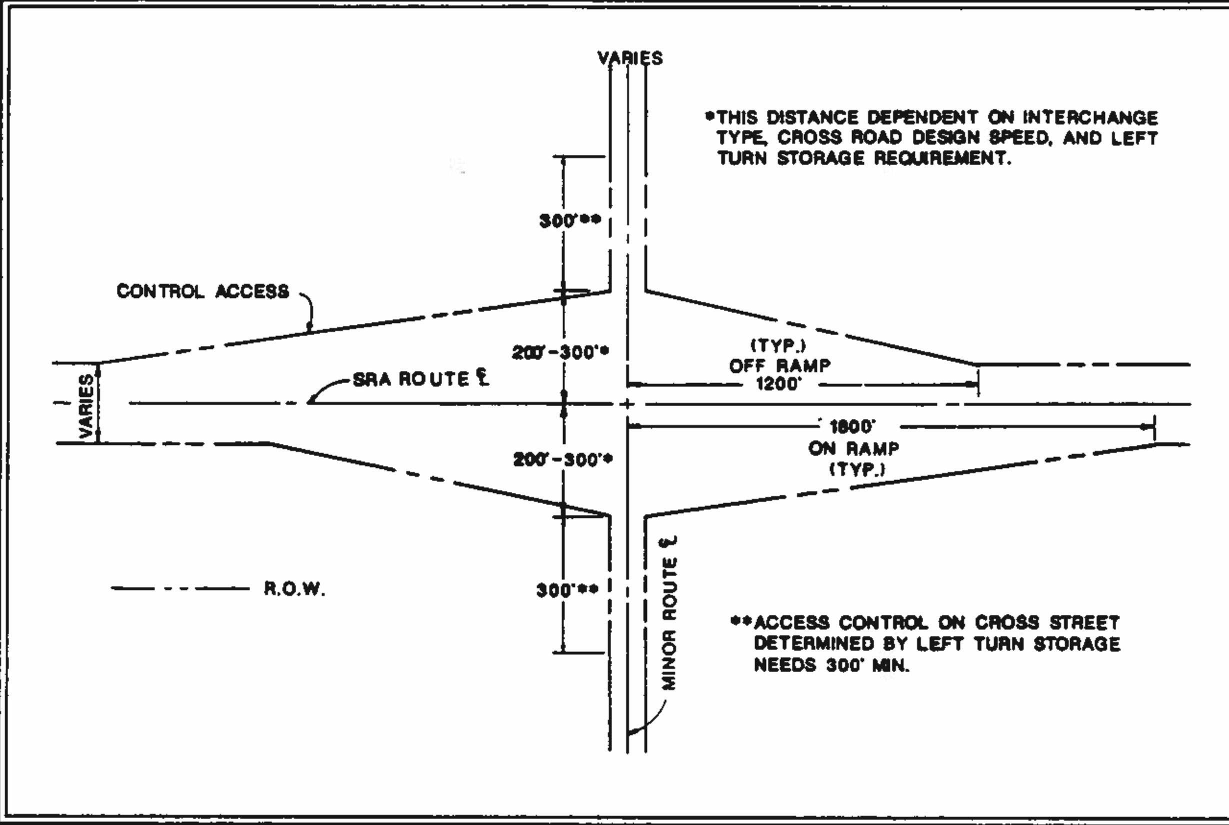


Figure 8.4 Right-of-Way Requirements for Single Point and Compressed Diamond Interchanges

All suburban SRA interchanges should have high mast lighting. The high mast lighting should not create "light pollution" problems from spillover into nearby residential areas.

8.3.2 Restrictive Right-of-Way

Some suburban SRA routes may presently consist of four or five lane pavement section through residential or commercial areas with minimal setbacks. It may not be feasible to obtain the additional right-of-way required for expansion into the desirable roadway cross section at these locations (see *Figure 5.1*).

If a suburban SRA route consists of a four lane cross section (two through lanes in each direction) in a restrictive right-of-way location, it is recommended that emphasis be placed upon the construction of an 18 foot median to separate left turning vehicles from the through stream of traffic. If no additional right-of-way is available for a median, left turns should be permitted only at major intersections. It is also critical to consolidate or control intermittent access point for commercial development and encourage internal circulation roadways outside the SRA right-of-way.

8.3.3 Route Bypasses

Certain suburban SRA routes are characterized by fairly long stretches of roadway that connect suburban central core areas. Milwaukee Avenue (Illinois Route 21) which connects Libertyville, Wheeling and Niles along its SRA segment is an example of such a route. Frequently these suburban central cores features traffic capacity constraints such as narrow right-of-way, minimal setbacks and numerous curb cuts and traffic signals. The desirable suburban SRA route typical section of six through lanes and an 18 foot median will generally not be attainable through such suburban cores.

It may prove advantageous to designate a route bypass for the SRA around these areas. Route bypasses around suburban cores should be designated on parallel facilities reasonably close to the original SRA route and must be clearly signed as such. Route bypasses may be designed to work in tandem with the originally designated SRA or may become the solely designated SRA. In either case, the travel demands of the area and stipulated level of service requirements should be met when a route bypass is proposed.

Due to the extent of suburban development, it is recommended that route bypasses be designated on existing routes and that construction of a new roadway for a route bypass be considered only where large tracts of undeveloped land or unused rights-of-way allow for continuity around the suburban core.

Roadways on the supplemental arterial system may also assist in diverting through traffic from suburban core areas and relieve traffic congestion on SRA routes. Actions would be required to educate the public about alternative routes and to optimize traffic flows on these routes.

8.3.4 Existing Interchanges

All existing interchanges between suburban SRA routes and the expressway/tollway system should be evaluated for their relationship to the entire roadway network. Recommendations for modifying these interchanges should follow the guidelines set forth under Section 7.3.3 in Chapter 7.

8.3.5 Major Projects/Corridors of the Future

The highway and transit major projects/corridors of the future identified in the 2010 Transportation System Development Plan and their relationship to the SRA system are discussed in Section 7.3.4 in Chapter 7.

8.3.6 Commencement/Terminus of SRA Routes

The special considerations involved with commencement/terminus points on SRA routes are discussed in Section 7.3.5 in Chapter 7.

8.4 ACCESS AND RIGHT-OF-WAY

8.4.1 Access Management

It is recommended that access management be coordinated among communities along each suburban SRA route.

The techniques in Section 7.4.1 in Chapter 7 of this report are also applicable to suburban routes.

8.4.2 Right-of-Way Protection

In addition to the techniques identified in Section 7.4.2 in Chapter 7 of this report, the following techniques may be considered for suburban SRA routes.

8.4.2.1 Special Purpose Public Access Easements

Prevailing setback requirements have created long stretches of privately held corridor unobstructed by buildings. This presents an opportunity to expand the right-of-way without substantial building demolition. Public access easements could be acquired in parking and setback areas for use as transit corridors or sidewalks (see *Figure 8.5*).

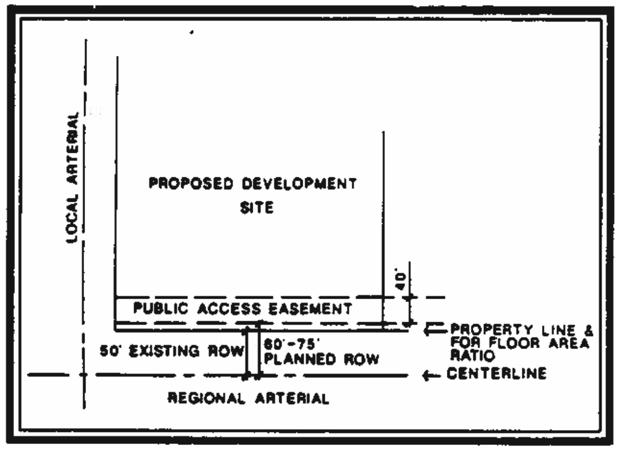


Figure 8.5 Public Access Easements

8.4.2.2 Purchase and Lease Back

Many local communities have acquired properties and then leased them back to their owners as long as the owners continue to live or do business on the property. This is a particularly appropriate strategy in those situations where the land will not be needed quickly or where allowing the buildings to remain would violate setback requirements. This strategy would allow land to be acquired with minimal hardship on the owner and with the understanding that any deviation from local requirements would be temporary.

8.4.2.3 Partial Purchase and Site Rehabilitation

The object of this strategy is to acquire enough of a site as is needed for the right-of-way and to make repairs or build facilities to restore the property to its original function. Examples might include parking spaces and corner businesses. Parking spaces can be rebuilt, if there is space elsewhere on the parcel. Corner commercial enterprises can be moved or rebuilt.

8.5 FREIGHT

Suburban SRA routes are characterized almost exclusively by off-route loading areas for freight vehicles. This is a desirable feature that contributes positively to roadway capacity and is a feature that should be maintained.

8.5.1 Structural Vertical Clearance Improvements

Existing structures on suburban SRA routes should have a minimum vertical clearance of 14 feet - 6 inches. If an existing structure does not meet this requirement, the primary method to develop the desired vertical clearance is to lower the roadway profile. When the minimum vertical clearance requirement cannot be met, consideration should be given to designation of an alternate freight route.

8.5.2 Turning Radius Improvements

Turning radii at intersections should allow the WB-55 design vehicle to make a turn without encroaching into adjacent or on-coming traffic lanes. Intersections that do not meet this requirement and intersections that are widened to provide separate right turn lanes should be constructed to accommodate the WB-55 design vehicle. Intersections that are evaluated for turning radii improvements should be considered for their impact on pedestrians and adjacent development before modifications are proposed.

If a particular suburban SRA route is designed as a Class II truck route, then the design vehicle is a WB-60.

8.5.3 Alternate Freight Route

It is desirable to accommodate freight vehicle on the suburban SRA routes. Alternate freight routes should be considered for segments of suburban SRA routes that have inadequate roadway geometric design features such as substandard clearance requirements at structures and intersections, less than minimum number of lanes, and where access to adjacent properties is not essential.

Frequently suburban central cores feature narrow right-of-way, minimal setbacks and numerous traffic signals. In these situations, it may prove advantageous to designate alternate freight routes because the majority of freight vehicles are making regional trips and are not bound for the suburban core, and a resultant effect would be improved roadway operations through the suburban core. Alternate freight routes should be designated onto parallel roadway facilities reasonably close to the suburban SRA route and must be clearly signed as such.

CHAPTER 9
RURAL SRA ROUTES

9.1 TRANSIT

Techniques associated with mass transit which may be applicable in certain rural situations are described below. All measures are supportive of bus and/or rail service and are consistent with the objectives of the SRA system.

9.1.1 Ridesharing

Carpools and vanpools are the most common forms of ridesharing. Carpools are frequently privately organized, but employers sometimes sponsor vanpools. In Northeastern Illinois, CATS and the Regional Transportation Authority assist with the organization and start-up costs of vanpools. CATS also provides assistance in identifying carpool participants, on request. Marketing and financial support for van and carpooling programs are strategies which complement the SRA program in general and, in rural areas where commutes are particularly long, can have a positive effect on vehicle occupancies.

The "jughandle" design of the frontage roads at rural SRA intersections, as shown on *Figure 6.2*, provides locations for park and ride facilities.

9.1.2 Improved Transit Station Accessibility

Improved transit station accessibility is discussed in detail in Section 8.1.7 in Chapter 8.

9.1.3 Transit Signage

Section 7.1.9 in Chapter 7.

9.2 ROADWAY OPERATIONS

9.2.1 Intersections

Intersections on rural SRA routes with more than four approaches often cause many operational problems. Excess approaches can be removed by closing the approach, by conversion to one-way traffic movement away from the intersection, or using extremely short signal timings to reduce the desirability of the approach. It is recommended that intersections with more than four approaches be reconfigured to remove the excess approaches away from the intersection.

9.2.2 Intersection Lighting

Rural SRA routes will not likely have continuous lighting. It is recommended, however, that all major intersections along rural SRA routes have appropriate intersection lighting.

9.2.3 Overhead Signing

All rural SRA-to-SRA route intersections should have advance overhead signing with route numbers and/or road names and, where appropriate, regional destinations indicated.

9.2.4 Delineators for Rural SRAs

Along rural SRA routes, delineators (light reflective devices) should be investigated for use where continuous lighting is not provided. In addition to aiding motorists at night, delineators are beneficial under inclement weather conditions such as fog, rain, and snow. Delineators should be installed in accordance with IDOT Standard 2149 of the IDOT Highway Standards Manual.

9.2.5 Eliminate Minor Road Access

The high speeds of vehicles on rural SRA routes can make intersections with minor roads potentially hazardous. Signalization of these intersections may improve safety but is not recommended because of the resultant increase in delays. The most desirable method of improving safety at these locations, while having the least effect on arterial traffic, is to eliminate the access to the minor road from the SRA.

Access to the SRA could be eliminated by either terminating the minor road or rerouting it to access the SRA at another location. Travel times will probably increase for motorists utilizing the minor road when this technique is implemented.

A detailed study on the feasibility of access removal must be conducted prior to implementation. Minor road traffic volumes, emergency vehicle response times, and the effects of displaced vehicles on other facilities should be included in this evaluation.

9.2.6 Deceleration Lanes

Due to the relatively high speed limits that will generally be posted on rural SRA routes, deceleration lanes for right turns should be provided along those segments where over 20 percent of vehicles are freight. An example of this would be the delivery and shipping entrance to a factory or warehouse facility. Deceleration lanes should also be provided when sight distance is limited and potential for rear-end collision is high such as an entrance located immediately past the crest of a hill.

In addition to using right turn deceleration lanes at all major intersections with the SRA, left turn deceleration lanes will also be used and would be designed in accordance with IDOT's channelized left turn lane design.

9.3 ROADWAY DESIGN FEATURES

9.3.1 Interchanges

It is recommended that right-of-way be protected at all intersecting rural SRA routes for eventual interchange construction as a post-2010 improvement. The single point diamond interchange is the desirable interchange type for rural SRA routes in almost all cases.

At rural SRA to rural SRA interchanges, the route with the highest projected traffic volume should have the through priority movement at the interchange.

If two intersecting rural SRA routes exhibit unusually high projected traffic volumes, a cloverleaf interchange type may be considered. The projected level of service on both routes should be D or worse with conventional improvements before the option is evaluated.

A final condition that warrants consideration of an interchange in the rural area is to replace an intersection which has an acute angle and exhibits a high incidence of accidents.

9.3.2 State and County Boundaries

Five rural SRA routes terminate at the Illinois/Wisconsin state line and two rural SRA routes terminate at the Illinois/Indiana state line. Several other SRA routes terminate at the McHenry/Boone, Kane/DeKalb, Kane/Kendall and Will/Kankakee county boundaries. It is quite possible that the SRA planning process will recommend roadway cross-sectional changes at these state and county boundaries. Features such as number of lanes and posted speed may change. Roadway tapers and transitions should be provided in those areas of roadway cross-section change to provide safety for motorists.

9.3.3 Route Bypasses

Many rural SRA routes are characterized by long stretches of roadway that connect existing communities. Illinois 31 connecting Richmond and McHenry is a typical example. A rural SRA route that passes through a commercial area of community may better serve the concept of regional mobility if it bypasses the narrow right-of-way, minimal setbacks, frequent access points and traffic signals typical of these areas.

The two options for route bypasses around rural communities are to designate an existing roadway facility or to construct a new roadway facility. It is recommended that route bypasses be assigned to existing roadway facilities where possible rather than constructing new roadway facilities. If an existing roadway facility is utilized as a route bypass, it should be reasonably close to the original SRA facility and clearly signed. Any route bypass should also have as a minimum partial access control. Where full access can be obtained without major problems, the route bypass should be designed accordingly.

If new construction is recommended, the bypass design should follow the roadway design criteria in *Table 6.2*. In new corridors, property owners may be willing to dedicate planned right-of-way if the alignment conforms to development plans for the property. There is a mutually beneficial relationship between property value and roadway access. Land along new corridors is significantly more valuable than land on less well travelled streets. The environmental for negotiating such agreements is improved when the corridor is sited along ownership boundaries or owner-designated access routes. It is recommended such agreements be explored prior to final alignment determination.

9.4 ACCESS AND RIGHT-OF-WAY

9.4.1 Access Management

Access management in rural areas is partly a matter of good planning for future development. Irregularly spaced driveways are particularly dangerous on these routes, because speed limits are higher and turning movements unexpected. Specific techniques for access management are described in Chapters 7 and 8.

9.4.2 Right-of-Way Protection

Techniques for right-of-way preservation are described in Chapters 7 and 8.

9.5 FREIGHT

The uninterrupted flow of traffic on rural SRA routes makes them highly desirable for freight vehicles and their regional trips.

9.5.1 Structural Vertical Clearance Improvements

Existing structures on rural SRA routes should have a minimum vertical clearance of 14 feet - 6 inches. If an existing structure does not meet this requirement, the primary method to develop the desired vertical clearance is to lower the roadway profile. New structures should be constructed with 16 feet - 3 inches vertical clearance.

9.5.2 Turning Radius Improvements

Where separate right turn lanes are constructed at rural SRA intersections, the turning radius should be designed to accommodate a WB-60 design vehicle wholly within the right lanes of the intersecting routes. The availability of right-of-way and absence of heavy pedestrian volumes should allow implementation of this turning radius.

9.5.3 Alternate Freight Routes

Alternate freight routes generally are not recommended for the rural SRA routes. However, existing communities located in rural areas may wish to have alternate freight routes designated to divert freight vehicles away from the community core area. Alternate freight routes can be considered when adequate parallel roadway facilities exist. The parallel roadway facilities should not be a major deviation from the rural SRA route and must be clearly marked.

9.6 BICYCLES AND PEDESTRIANS

More options are available on rural SRA routes for handling pedestrian and bicycle access. For example, while right-of-way availability is still a critical issue, dense development immediately adjacent to the roadway is not as common an occurrence. Provisions for bicycles and pedestrians may be accommodated within the SRA right-of-way itself. In rural situations alternative parallel routes may not always be available. The choice of how to provide access within the SRA corridor should be based on each unique situation. Under all situations, the goal is to have a continuous system of bicycles and pedestrian facilities.

As in the cases of the urban and suburban SRA routes, access across major obstacles or barriers will be handled by the SRA if alternative access is not feasible.

CHAPTER 10
GENERAL POLICY AND PROGRAM RECOMMENDATIONS

10.1 RIGHT-OF-WAY ISSUES

10.1.1 Right-of-Way Protection in Advance of Need

Potential right-of-way needs are best planned for and protected well in advance of need. The closer land is to development the more valuable it becomes. The governmental entity responsible for each SRA should place a high priority on the protection or acquisition of the amount of right-of-way needed for the ultimate desired improvement.

It is recommended that changes be considered in the State enabling statutes for the Illinois Department of Transportation (IDOT) and a high degree of cooperation from local governments be solicited. Long range protection of right-of-way appears to be hampered by existing statutes. IDOT "shall make a survey and prepare a map showing the location and approximate widths of the rights of way need for future additions to the highway system" (Illinois Revised Statutes Chapter 121 Sec 4-510). Owners must notify IDOT 60 days before development.

Problems arise when purchase of property is required fairly quickly after it is proposed for development. (IDOT is allowed 45 days to respond to the owner notification and 120 days after that to actually buy or begin to condemn the land.) This requirement generates a potential cost burden upon adoption of a right-of-way. Thus, if right-of-way is mapped after each phase of the SRA project, IDOT could be required to buy a substantial amount of land soon thereafter. This capital expense could occur decades in advance of planned construction and with no absolute guarantee that the right-of-way would be needed.

State law would appear to allow counties and municipalities to acquire right-of-way (IRS Chapter 121 Sec 4-510). It appears that counties and municipalities can require dedications as part of the subdivision process. It is recommended that counties and municipalities adopt dedication requirements for the SRA as part of their subdivision process regardless of the roadway ownership. It is further recommended that the Official Map be studied as the appropriate tool for implementing the requirements.

10.1.2 The Municipal Official Map

The municipal official map is a logical vehicle to protect SRA right-of-way as soon as future right-of-way needs are determined Municipalities appear to have the power to adopt an Official Map. This map is prepared with the comprehensive plan and may be adopted by ordinance. The map "shall specifically state standard requirements of the municipality relating to size of streets..." (IRS Chapter 24, Section 11-12-6). When subdivision plats are filed, they appear to be required to meet those standards. This would indicate that municipalities can and should include the SRA right-of-way in their official maps. When land is subdivided, SRA right-of-way would be part of the plat.

10.1.3 Real Estate Options for Right-of-Way

It would appear that existing authority in the Illinois Revised Statutes to use real estate options as a holding or banking device for right-of-way is unclear. This tool would be particularly valuable for land expected to remain undeveloped for at least five years. For payment of a small percentage of the current value of the land, an option is an agreement with the landowner that allows the acquirer to buy the land at any time during the period of the option for a price set at the beginning of the option. It is recommended this strategy be thoroughly explored and enabling legislation considered if needed.

10.2 ACCESS POLICIES

10.2.1 Ingress/Egress for Adjacent Property

IRS Chapter 121 Section 4-210 is apparently the only statute enabling IDOT to regulate, in any way, ingress and egress along an SRA. This seems to permit only design review. Thus, IDOT may not have control over how many points of ingress/egress there area.

It is recommended that:

- The IRS be revised to allow IDOT to refuse direct access permits to the State highway as long as other reasonable access to the transportation network exists, and

- IDOT work with municipalities to insure spacing standards for access to SRAs are included in local subdivision regulations.

Both should be pursued to insure all SRA routes are protected from unregulated access.

10.2.2 Ingress/Egress to Adjacent Property

It is recommended that limited easements be considered to route certain right-of-way uses to corridors outside of the SRA right-of-way. Such uses might include transit corridors and stops, bikeways, parkways, and sidewalks. The cost of these easements can be expected to vary directly with the burden/benefit to the property owner.

The cooperation of local governments during the subdivision process may help assure such easements would be more of a benefit than a burden. For instance, if a sidewalk and parkway were considered part of a landscaping requirement in a retail development, the owner could bring shoppers closer to the stores, meet the requirements of the subdivision ordinance, and relieve the SRA right-of-way of certain uses.

The cost for such easements could effectively be the same as appropriating funds for physical roadway widening, because the recovered right-of-way could be used for lanes of traffic. Costs should not exceed those of purchase of continuous roadway or the limited easement loses it value as an alternative.

10.3 EXTRA-JURISDICTIONAL PROJECT PARTICIPATION

10.3.1 Non-State SRA Routes

Not all SRA routes are State highways. Local governments receive a motor fuel tax allotment based on their population, but these allotments may not be consistent with the regional transportation burden they are asked to accommodate. This would be particularly true for small communities located along routes connecting major employment and residential centers.

It is recommended IDOT consider participation in improvements to these route segments for the benefit of the entire system. Such cost sharing may encourage these local governments to support local changes needed to implement improvement recommendations. It is also recommended IDOT explore with local governments in the Northeastern Illinois region the possibilities of alternate motor fuel tax allotment formulae that would recognize the regional nature of the SRA system.

10.3.2 Non-SRA Arterial Routes

Normally, the State does not participate in roadway improvements outside State rights-of-way. There are selected instances where such participation would be cost effective and have positive effects on the SRA system. Examples of such instances include offset intersections and older community commercial centers.

Offset roadways may occur where non-SRA arterial routes intersect the SRA at different points in the route. An example of this situation is Busch and Deerfield Roads as they terminate at Milwaukee Avenue (IL 21), an SRA route. East-west traffic continuing through from one offset arterial to another must travel a portion of Milwaukee Avenue.

A non-SRA improvement linking Busch with Deerfield for east-west travelers would significantly reduce congestion along this segment of Milwaukee Avenue. Such a link could be built on undeveloped land rather than widening the developed right-of-way along Milwaukee. This link might also encourage more east-west travelers to use the route thereby relieving Lake-Cook Road and Half Day Road, both parallel SRA routes, of some congestion.

The City of McHenry is an example of a community with an older commercial center. IL 120 and IL 31 meet and pass through the commercial center along Elm Street. The rights-of-way are relatively narrow and setbacks include only the sidewalk and parking.

Rerouting IL 120 and/or IL 31 around the heart of McHenry would maintain the commercial center and greatly relieve congestion. Non-State routes in the area might form segments which could be considered for bypasses in such situations.

10.4 TRAFFIC MANAGEMENT POLICIES

10.4.1 SRA Route Marker Designations

Consistent and distinctive SRA route markers can create an awareness of the SRA routes as a distinct network. Unique SRA plates could be created, similar in size to the standard cardinal direction plates, and would be used in conjunction with the existing standard route number markers. Drivers would come to expect fewer impediments for through traffic and some consistency of ingress/egress patterns. This awareness should reduce driver confusion and may help differentiate SRA routes from local streets. As part of an overall system, SRA route markers should be placed at appropriate intervals and at junctions with expressways and other major arterials.

10.4.2 Policy for New Traffic Signals

Efficiency of traffic movement is most often determined by the spacing and timing of traffic signals. New signals should not degrade existing signal progression.

Signal warrants for the SRA routes should be more stringent than for other arterials. Current signal warrants have resulted in placements which are dysfunctional to the efficient progression of through traffic. There are now 11 signal warrants in the Manual on Uniform Traffic Control Devices (MUTCD). One of these warrants could probably be met at every intersection along an SRA, especially in the urban and suburban areas. These warrants are:

Warrant 1 -	Minimum Vehicular Volume
Warrant 2 -	Interruption of Continuous Flow
Warrant 3 -	Minimum Pedestrian Volume
Warrant 4 -	School Crossings
Warrant 5 -	Progressive Movement
Warrant 6 -	Accident Experience
Warrant 7 -	Systems
Warrant 8 -	Combination of Warrants
Warrant 9 -	Four Hour Volumes
Warrant 10 -	Peak Hour Delay
Warrant 11 -	Peak Hour Volume

Consideration should be given to dropping some warrant entirely for SRA routes, such as warrants 9, 10, 11. Others should be changed for SRA routes. For example, cross street delay criteria for Warrant 2 should reflect much longer delays. Warrants, 1, 2, 8, and 11 allow for the reduction of the necessary traffic volumes if more than 15 percent of the drivers are exceeding 40 miles per hour, and should also be eliminated for SRA routes.

New signal installations along SRA routes should meet a standard for intersection spacing. New signals should be spaced no less than 1,320 feet on urban and suburban routes and no less than one-half mile on rural routes. Where these minimums are not workable, the new signal should be placed where it will have a minimal impact on signal progression. The time available for progression should be at least 30 percent of the available green time at the critical intersection.

New signal installation proposals should also be required to include a complete review of other reasonable alternatives. Such alternatives should be employed whenever possible.

10.4.3 Review of Warrants for Existing Traffic Signals

Existing signals should be periodically reviewed to insure they are still warranted. As land use changes and redevelopment occurs, different circulation patterns emerge. This result is particularly likely where local governments adopt more explicit site design criteria for access to the SRA. When traffic signals are no longer warranted, they should be removed.

10.4.4 Lighting

Each appropriate highway jurisdiction should provide lighting for SRA routes. Headlights alone do not provide proper visibility. Urban and suburban SRA routes should be continuously lighted. Rural SRA routes should be lighted at intersections and interchanges.

10.4.5 Incident Management

Efficient response to accidents and other incidents will reduce their impact on traffic flows. It is recommended that an area-wide incident response system be developed in coordination with local law enforcement officials and media. This system could be quite similar to that of the Illinois Expressways. Incidents could be reported to a central clearinghouse either by law enforcement officials or drivers with car phones. Incident patron teams, SRA "Minutemen," would reduce response times. Radio and television traffic reports could include construction and incident delays on the SRA system in their coverage. Such traffic reports should include alternative routing suggestions.

10.5 ROADWAY MAINTENANCE

10.5.1 Periodic Maintenance

An inter-agency, comprehensive program for maintenance evaluation, scheduling and performance should be established. This program should work to ensure that all SRA routes will function at their highest level and that safety and efficiency will not be compromised. It is recommended that maintenance work be scheduled for off-peak times or at night whenever possible. This would reduce or prevent disruption of peak traffic flows. Increased lighting levels may be required for night maintenance.

10.5.2 Maintenance and Construction

The respective SRA jurisdictional bodies should establish policies mandating that the SRA routes have the highest priority for routine and seasonal maintenance, such as patching and snow removal, after the expressway system. It is suggested that programming of construction improvements on the SRA and adjacent routes be coordinated to ensure sufficient system capacity remains during construction.

10.5.3 Regional Construction Map

IDOT and the other highway jurisdictional agencies should jointly produce a regional construction map which highlights on-going and scheduled construction projects on the expressway system and SRA network. This regional construction map should be updated quarterly.

As technological advances are made, this regional construction map could be integrated into the driver information systems discussed in Section 7.2.2.

10.6 ENFORCEMENT

10.6.1 Parking

On some SRA routes, parking may be restricted during peak travel periods. Parking restrictions are only effective when they are enforced. Local governments may not have the resources necessary for enforcement, and consideration should be given to non-local funding for this purpose where appropriate. Enforcement should include a corps of officers who would patrol heavily congested areas. Tow trucks should be available during peak periods.

10.6.2 Freight Loading

Providing funds for enforcement of peak-hour loading restrictions is necessary and consistent with the recommendations on parking enforcement above.

10.7 DEMAND MANAGEMENT

Demand management and related activities to improve transit are also components of Operation Green Light. The focus of these components is to reduce the number of vehicles on the roadway by increasing the number of people in each vehicle. This effort is very important to SRA.

Demand management is a particularly difficult task in areas outside of the Chicago central area. The intense concentration of workers in the central area, expensive parking and history of travel by mass transit contribute to commuter support of the readily available transit and make ridesharing more attractive.

It is recommended that demand management programs recognize and address the suburban commuter perspective. Safety, convenience, flexibility, and reliability are all factors contributing to the choice of the individual auto. Techniques for increasing the rate of participation might include:

- Flextime;
- Employer-based open houses to introduce potential ridesharers;
- Residential complex, neighborhood, or small community based efforts;

- Emergency cab service for vanpoolers;

- Preferential facilities, especially parking, for high occupancy vehicles and bicycles; and

- One- or two-day-a-week ridesharing.

It is further recommended that jurisdictions in the Northeastern Illinois region consider disincentives for personal commuting and discretionary commercial travel during peak periods which pass on to those vehicle operators the actual cost of travel during those periods. Techniques being explored by other states include a tax levy for each parking space and mandatory parking charges.

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GLOSSARY

Actuation. The sensing or detection of a vehicle as it passes over a detector in the roadway pavement for the purpose of communicating information about traffic flow to a master traffic signal controller.

Class II Truck Route. Any highway, other than an interstate highway or controlled access highway with four or more lanes, which is designated as such and capable of handling size and weight limits for trucks.

Delineators. A light-reflecting device mounted at the side of a roadway, in series with others, to indicate the alignment of the roadway.

Demand Management. Techniques such as carpooling, staggered work hours and controlled development which are employed to reduce the number of vehicles utilizing a roadway.

Grade Separation. A bridge for a crossing of a highway, railroad, pedestrian or bike path over another highway.

High Occupancy Vehicle (HOV). Any vehicle which is occupied by at least a specified minimum number of passengers.

Intersection Triangle. The triangular configuration that is formed when a diagonal arterial street intersects two streets which are part of the normal grid street pattern.

Level of Service. A qualitative measure used to describe the operating conditions of a roadway.

Median Control. The use of a raised median curb to direct left turning movements to desired locations and to reduce conflicts between oncoming vehicles.

Signal Network (System). A group of traffic signals along an arterial roadway or in a grid patten which are able to communicate to a master traffic controller and operate in coordination.

WB-50 (60) Design Vehicle. A large semi-trailer vehicle with a wheelbase dimension of 50 (60) feet which is used to establish the minimum requirements of roadway design so that the roadway can safely accommodate such a vehicle.