

Earth Tech, Inc.

Kenosha-Racine-Milwaukee Commuter Rail Extension *Environmental Impact Statement & Project Development Phase*

Definition of Alternatives

in association with:

HNTB

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DEFINITION OF ALTERNATIVES

ABBREVIATIONS USED IN THIS REPORT

AA – Alternatives Analysis
ADA – Americans with Disabilities Act
BRT – Bus Rapid Transit
BUS – Belle Urban System (Racine transit system)
CBD – Central Business District
Commission – The Southeastern Wisconsin Regional Planning Commission
CNS&M – Chicago, North Shore and Milwaukee (Electric) Railway
CNW – Chicago & North Western Railway
CP – Canadian Pacific Railway
CTA – Chicago Transit Authority
DEIS – Draft Environmental Impact Statement
DMU – Diesel Multiple Unit (Rail Car)
EMU – Electric Multiple Unit (Rail Car)
FBO – Full Build Out (supplement to MOS)
FHWA – Federal Highway Administration
FTA – Federal Transit Administration
GMIA – General Mitchell International Airport (Milwaukee)
HOV – High-Occupancy Vehicles
HRT – Heavy Rail Rapid Transit
KRM – Kenosha-Racine-Milwaukee, in reference to the transportation corridor
KT – Kenosha Area Transit
LPA – Locally Preferred Alternative
LRT – Light Rail Transit
MARS – Milwaukee Airport Rail Station
MCTS – Milwaukee County Transit System
MOS – Minimum Operable Segment
MPO – Metropolitan Planning Organization
NB – Northbound
NEPA – National Environmental Policy Act
NHS – National Highway System



DEFINITION OF ALTERNATIVES

NICTD – Northern Indiana Commuter Transportation District

OTC – Ogilvie Transportation Center (Chicago)

PE – Preliminary Engineering

PSA – Purchase of Service Agreement

RID – Rock Island District

ROW – Right of Way

RTA – Regional Transportation Authority (Illinois) or Regional Transit Authority (Wisconsin)

SB - Southbound

STH – State Trunk Highway (Wisconsin)

TIP – Transportation Improvement Program

TMA – Transportation Management Association

TSM – Transportation System Management

UP – Union Pacific Railroad

WCL – Wisconsin Coach Lines

WisDOT – Wisconsin Department of Transportation



DEFINITION OF ALTERNATIVES

Major employers, municipalities, and counties throughout the corridor want improved transit service.

This phase of the KRM project builds upon the results of previous studies.

I. INTRODUCTION

Over the past decade a very high level of interest has developed in the Kenosha-Racine-Milwaukee (KRM) corridor for improved commuter transportation service. This interest has been manifested by the creation of a group involving major employers, municipalities and counties which has as its objective the improvement of transit service within the corridor. The Southeastern Wisconsin Regional Planning Commission, the Metropolitan Planning Organization (MPO) for the seven-county Southeastern Wisconsin region, has completed two studies^{1,2} which focus on transit improvements throughout the KRM corridor.

On behalf of an intergovernmental partnership of the counties and cities of Kenosha, Racine and Milwaukee, the Wisconsin Department of Transportation (WisDOT) and the Regional Planning Commission, the Commission is undertaking the EIS and Project Development phase of the KRM Alternatives Analysis (AA) in order to produce a Draft Environmental Impact Statement (DEIS), refine the previous alternatives analysis, and further develop a commuter transportation project within the corridor. This study is funded by the Federal Transit Administration (FTA) Section 5309 "New Starts" program, WisDOT, and the members of an Intergovernmental Partnership consisting of the Cities and Counties of Kenosha, Milwaukee, and Racine, the WisDOT, and the Regional Planning Commission. The products of this study will be used to support an application to the FTA for funding of Preliminary Engineering (PE) under the FTA's New Starts program.

¹ Feasibility Study of Commuter Railway Passenger Train Service in the Kenosha-Racine-Milwaukee Corridor, Community Assistance Planning Report No. 239, Regional Planning Commission, Waukesha, WI, June 1998.

² Kenosha-Racine-Milwaukee Corridor Transit Study Summary Report and Recommended Plan, Community Assistance Planning Report No. 276, Regional Planning Commission, Waukesha, WI, August 2003.



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Various modes will be considered as alternatives.

Environmental and land use implications will be evaluated.

A locally preferred alternative will be chosen.

II. PURPOSE

This Definition of Alternatives report documents the process by which the various alternatives were defined and selected. It also provides graphic and narrative definition of the No-Build, Transportation System Management (TSM), Bus Rapid Transit (BRT) and Commuter Rail Alternatives evaluated during the EIS and Project Development Phase of the project.

The environmental impacts and benefits of the BRT and commuter rail alternatives will be identified and assessed throughout the course of the study. A Draft Environmental Impact Statement (DEIS) will be produced in a manner that is responsive to the relevant requirements of the National Environmental Policy Act (NEPA). The land use and development implications of each "build" alternative will also be identified and assessed, as will the ridership potential, relative contributions to the enhancement of regional mobility, capital, operating and maintenance costs, operating efficiencies, resultant cost effectiveness, and other factors.

The information arising out of these analyses will form the basis for the evaluation and ranking of the alternatives. That evaluation and ranking will in part be achieved through comparison with a Baseline Alternative, which will be derived from some combination or extension of the No-Build and TSM Alternatives³. That Baseline definition will be agreed upon with the FTA before comparisons begin. The selection of a Locally Preferred Alternative (LPA) will arise out of this evaluation process. A financial plan will be developed for the LPA and used in part to determine the FTA New Starts funding share. The financial plan, together with attendant land use and development, mobility and cost-effectiveness data, will serve as the

³ FTA, Reporting Instructions for the Section 5309 New Starts Criteria, April 2005, p. 10.



DEFINITION OF ALTERNATIVES

Defining the candidate alternatives follows a logical process.

principal components of a request to the FTA to proceed into Preliminary Engineering (PE).

III. METHODOLOGY

The methodology employed in defining the alternatives to be evaluated during the KRM Alternatives Analysis consists of the following steps:

- Review and assess the transit modes and alternatives defined during the prior transportation planning and alternatives analysis work;
- Produce a Purpose and Need Statement identifying the market sectors served and encompassing a range of reasonable options including low, intermediate and high-cost strategies and a minimum operable segment (MOS) for fixed-guideway investments;
- Develop a No-Build Alternative incorporating selected planned and programmed public transportation and system management improvements described in the Transportation Improvement Program for the area;⁴
- Develop a Transportation System Management (TSM) Alternative that assumes the enhancement of existing commuter rail, streetcar and bus service throughout the corridor in the most cost-effective manner possible, including improved bus circulation and increased park-and-ride capacity in strategic locations;
- Develop “build” alternatives for bus and rail modes that are competitive and provide a safe, convenient and cost-effective service through refinement and innovation, while recognizing the constraints imposed by existing operational and institutional realities.

A Baseline Alternative for comparison with the Build Alternatives will be derived from some combination or extension of No-Build and Transportation System Management (TSM) Alternatives. That Baseline

⁴ A Transportation Improvement Program [TIP] for Southeastern Wisconsin: 2004-2006, Regional Planning Commission, Waukesha, WI, December 2003.



DEFINITION OF ALTERNATIVES

All alternatives are based on an understanding of the current principal corridors of public transportation.

definition will be agreed upon with the FTA before these comparisons begin. In most cases, the FTA New Starts Baseline Alternative is the TSM Alternative.⁵

Various bus and rail transit modes are considered as Build Alternatives. Various options within those alternatives are also reviewed. A first-level screening was performed on the various Build Alternatives using criteria that relate to the geography and demographics of the corridor, the nature of existing commuter and intercity passenger rail service, costs and technical characteristics of the modes. The remaining alternatives are considered the most feasible ones and are carried forward with the Baseline into the project.

Wisconsin state trunk highways (STH) 31 and 32 connecting Kenosha and Milwaukee serve as the principal corridor for the provision of improved public transportation service throughout this study. This corridor includes not only those two highways, but also other existing parallel rights of way (ROW) within the more populated approximately three-mile wide band along the lakeshore. Commuter transit stations, park-and-ride facilities and transit centers are located principally within or directly adjacent to this corridor in order to serve most efficiently the communities that will be the primary benefactors of the commuter service improvements. The I-94 corridor was also evaluated in terms of its potential as a priority corridor at the outset of this study, but was determined to be too distant from major population and employment centers to provide convenient and cost-effective transit service or to have a positive influence on land use and development patterns to the same extent as would comparable improvements in the STH 31/32 corridor.

⁵ FTA, New Starts Project Planning, Technical Guidance, Advanced Major Transit Investments through Planning and Project Development, Part I Planning and Project Development Guidelines, page 7, FTA website, November 2005.



DEFINITION OF ALTERNATIVES

Field work leads to alignment proposals and preliminary operating plans.

The work required for defining the alignments of various transit alternatives relies on both macro and micro analyses. The macro analysis takes a large-scale view of where people live and where activity and employment centers are located. Using maps of previous studies, existing and abandoned railroads, streets, highways, transit service, and bike paths, and also transit schedules, aerial photographs, and public comments from the previous study phases and other sources, the macro process defines plausible paths that might serve as alignments or portions of alignments for the various modes studied in the project. Operational issues of the transit alternatives are also considered at a similar macro level for each alternative.

Armed with those macro results, the subsequent micro analysis was initiated with a first field visit to the plausible paths. Notes were taken on aerial photographs as to existing restrictions and, if feasible, how the various transit mode alternatives could be made to work along the alignments. Comparisons are made among the various alignments using group professional judgment supported by gross cost and/or travel time estimates where appropriate. Ultimately, the micro study selects specific feasible alignments for the transit modes retained for study. A preliminary operations plan is also completed for each alternative using the feasible alignments. The combination of transit mode, preliminary alignment and preliminary operating plan constitutes the essence of each alternative that is carried forward for more detailed analysis and possible refinement in the cost estimating phase of the project.

All alternatives will be reviewed with the FTA, the Regional Planning Commission and the project Steering Committee prior to finalization.

The definitions of the TSM and Build Alternatives form the foundation for the assessment of land use and development impacts and benefits, ridership potential, relative contributions to the enhancement of regional



DEFINITION OF ALTERNATIVES

The transportation system management (TSM) Alternative has been identified through a 3-step process.

Further investments to operate bus rapid transit (BRT) alternatives follow the TSM..

mobility, capital, operating and maintenance costs, operating efficiencies, resultant cost effectiveness, environmental analyses, and other factors. The information arising out of these analyses forms the basis for the evaluation and ranking of the alternatives and the selection of a Locally Preferred Alternative.

The overall methodology for the definition of all alternatives starts with work to identify improvements for the TSM. However, several of the early steps are also structured to provide inputs to later steps for other Build Alternatives.

1. An office review of maps will review current transit routes and identify potential alignment improvements for existing transit and the TSM.
2. A site visit of the identified alignment improvements will record current conditions and available data with photographs and field notes recorded on aerial photographs. (This work will also include work on other alternatives as discussed in later steps.)
3. The collective professional judgment of a team of experts will be used to select the most effective low-cost improvements that are used in the TSM.

The steps continue for the BRT Alternative as follows:

4. The long range regional transportation system plan for the area will be reviewed for planned projects which do not currently have committed funding, but which would have an impact on a BRT Alternative. Those projects may include widening state trunk highways (STH) from 2 to 4 lanes. Selected projects are considered for inclusion in the BRT Alternative later in the project.
5. The results from the previous steps 2 to 4 are used to identify locations on existing road and highways where cost-effective investments can be made to increase speed limits in restricted areas. These investments might include traffic signaling prioritization, highway designs (left turn restrictions, left turn lanes, lane dividers,



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Other transit alternatives are formulated in parallel with BRT.

etc.) or added lanes.

6. Where cost-effective improvements to existing roads and highways are not practical, the data base from earlier work is used to identify rights of way (ROW) where construction of totally new bus lanes is plausible. The working definition of "plausible" is the Step 2 visual confirmation of sufficient room for a bus lane(s) in existing rights of way. The piecemeal assembly of land parcels into totally new ROWs in urban or rural areas is generally considered too difficult legally and too expensive for this step, but could be reconsidered later in the cost estimating task of the project if BRT exclusive ROWs are not available. In addition, the positions of the current owners of the plausible ROWs are not considered in this very early analysis.
7. Alignment(s) for the BRT Alternative are selected using combinations of improvements to existing roads, new busways, and, as a last resort, segments of lower performance local roads as defined for the TSM.

Other transit alternatives are formulated in parallel with BRT:

8. In parallel with the previous steps, earlier studies and plans in the region and specific to the corridor will be reviewed to determine new transit technology modes, or combinations thereof with bus, which might be applicable as Build Alternatives in the corridor.
9. All options within the commuter rail alternative will be reviewed and the two most practical applications to KRM will be defined for rolling stock, alignment, preliminary station locations, and level of service.



DEFINITION OF ALTERNATIVES

In a process starting in 1981, three technology alternatives have been identified for the KRM corridor.

IV. RANGE OF ALTERNATIVES

1. Background

Previous Screening of Modes

In 1981 and 1982, the Commission undertook studies of transit technology appropriate for the region^{6,7}. In addition, the Commission first adopted regional land use and transportation plans in 1966, and has generated successive generations, or reaffirmations, of those plans in 1978, 1994, 1997 and 2003.⁸ The Commission is currently in the process of developing the next generation of these plans. Those current-draft, fifth-generation plans have a design year of 2035.

All of the regional transportation plans since the 1981-82 studies have revisited and reaffirmed the transit technology conclusions from that original work, including:

- A number of technologies were determined to have no immediate applicability as primary transit systems in the region. These technologies included, for example, moving way transit, monorails, automated guideway transit, trolley bus, street cars and light rail, and heavy rail.
- Eight technologies were identified in the 1981 study as having potential for providing primary transit service in the region.

⁶ State-of-the-Art of Primary Transit System Technology, Regional Planning Commission, , Technical Report Number 24, February 1981.

⁷ A Primary Transit System Plan for the Milwaukee Area, Regional Planning Commission, Planning Report Number 33, June 1982.

⁸ The series of these plans is documented in: A Regional Transportation System Plan for Southeastern Wisconsin: 2035 (Final Draft), Chapter 1, footnote 1.



DEFINITION OF ALTERNATIVES

KRM corridor technology alternatives have been narrowed to commuter bus, BRT and commuter rail.

- The 1982 report provided an additional screening that further reduced the number of technologies, identified potential fixed guideway transit corridors in the greater Milwaukee area, and selected transit modes most applicable to the corridors.
- Three corridors were identified where commuter rail might be applicable. The KRM corridor was found to be the strongest candidate of the three.
- Bus technology (urban, commuter bus and bus rapid transit) was found to be applicable generally to the entire region.
- Four possible bus rapid transit (BRT) options were identified:
 1. Mixed traffic on freeways
 2. Reserved lanes on freeways
 3. Exclusive busways
 4. Reserved lanes on surface arterial streets⁹.

As a result of this work, three technology alternatives have been identified as having possible application to the KRM corridor: commuter bus, BRT and commuter rail. Commuter bus is utilized under the Transportation System Management (TSM) Alternative in this study. Furthermore, within the BRT and Commuter Rail Alternatives, various options are evaluated.

Major Highways

This section briefly describes the current roadways in the KRM corridor. The existing infrastructure in the primary study area is shown in **Figure IV-1**.

⁹ *Op. cit.*, Commission, 1981, page 230.



DEFINITION OF ALTERNATIVES

FIGURE IV-1. EXISTING TRANSPORTATION INFRASTRUCTURE





DEFINITION OF ALTERNATIVES

A network of roads provides the basic transportation infrastructure for the region.

Interstate and state highways connect Chicago to Milwaukee.

The corridor has a comprehensive network of roads which have a hierarchical functional structure. These range from interstate highways, which are designed to freeway standards, to local streets. Of greatest interest are the north-south oriented roadways which serve longer distance, regional travel. These include:

Interstate 94

This limited-access interstate highway forms the western boundary of the study area. Interstate 94 is a long freeway connecting major cities in the Upper Midwest and Great Lakes regions. It is the primary roadway between Chicago and Milwaukee and the primary expressway in the study area. Starting in downtown Chicago, the route is variously known as it progresses north as the Kennedy or Edens Expressway up to Deerfield. Its interstate highway alternate route, I-294, runs parallel to and generally 15 miles west of it in the Chicago suburbs where it is known as the Tri-State Tollway. I-294 connects back to I-94 approximately 25 miles north of downtown Chicago in Deerfield where the Tollway becomes simply I-94 and continues to the Illinois-Wisconsin state line. In Wisconsin, I-94 is located approximately ten miles west of the Lake Michigan shoreline. In downtown Milwaukee, I-94 changes from a north-south direction to east-west, continuing to Madison, the Twin Cities and points beyond. Major portions of I-94 and I-294 form the western border of the study area.

Wisconsin State Trunk Highway 32

This state north-south highway runs through the established shoreline areas of Kenosha, Racine and Milwaukee Counties. Passing through downtown Milwaukee (one-way couple of N. Broadway and N. Milwaukee Streets), the route continues north to Green Bay and beyond. To the south of Kenosha, the roadway connects to Illinois Route 137, which continues south to North Chicago, then turns westerly to Grayslake in central Lake County, Illinois. State trunk highway (STH) 32 is part of the



DEFINITION OF ALTERNATIVES



Five agencies and five private bus lines provide local transit services to the region.

Federal Highway Administration's (FHWA) National Highway System (NHS).

Wisconsin State Trunk Highway 31

Wisconsin STH 31 is located parallel to, and approximately five miles west of, STH 32, serving areas outside of the historic development of the shoreline communities. The northern terminus of STH 31 is at its intersection with STH 32 near County Route G in the Town of Caledonia in Racine County. The route connects to Illinois Route 131, which terminates at Illinois Route 176 in Lake Bluff. STH 31 is also a part of the NHS.

Public Transit

Figure IV-2 shows the existing rail, bus and streetcar public transportation services in the corridor. Local transit services in the study area are provided primarily by three agencies: Milwaukee County Transit System, Racine Belle Urban System and Kenosha Transit. Amtrak, Metra, Wisconsin Coach Lines (WCL), Badger Bus Lines and Greyhound Bus Lines provide regional and intercity transit services. In addition, Wisconsin Coach Lines provides intercity transit services connecting airports in Milwaukee and Chicago, the Milwaukee Amtrak station and other destinations in the study area, while Lamers Bus Lines provides connecting scheduled service with Amtrak for destinations in central Wisconsin and Megabus provides direct Milwaukee-Chicago non-stop low fare bus service.



DEFINITION OF ALTERNATIVES

FIGURE IV-2. EXISTING BUS/RAIL/STREETCAR PUBLIC TRANSPORTATION





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*Amtrak operates
intercity passenger
rail service between
Chicago and
Milwaukee.*

Overall, these transit providers cover large portions of the study area with varying levels of service. Only the WCL bus service provides regular “commuter” transit among all the major urbanized centers in the corridor. Transit providers do to some degree coordinate services, particularly in those places where operations overlap. For example, Kenosha Transit schedules local bus and streetcar service to serve Metra arrivals and departures at the Kenosha Depot, and Milwaukee County Transit buses serve the Milwaukee downtown Amtrak station and Greyhound Bus depot. At this time, no agency coordinates the activities of all providers.

The following description of current public transportation services in the study area includes details on rail transit, intercity bus, commuter bus, local fixed route bus, and streetcar service.

Amtrak

The National Railway Passenger Corporation, Amtrak, operates intercity passenger service between Milwaukee and Chicago with two services, the *Hiawatha* and the *Empire Builder*. Amtrak trains operate on the historic Chicago-Milwaukee-St. Paul alignment, now owned by the Canadian Pacific Railway (CP) and Metra (south of Rondout Junction in Illinois). The Amtrak route in the study area is located five miles west of the cities of Racine and Kenosha; that is, Amtrak does not directly serve these communities. Between Chicago and Milwaukee, Amtrak service includes intermediate stops in Glenview, Illinois, and Sturtevant in Racine County. In addition, *Hiawatha* trains stop at the Milwaukee Airport Rail Station.

Amtrak’s *Hiawatha* service provides seven weekday round trip trains between Milwaukee and Chicago, with six round trips on weekends. Travel time between Milwaukee and Chicago on the *Hiawatha* service is 89 minutes, with intermediate stops at Glenview, Sturtevant and the Milwaukee Airport Rail Station. The earliest northbound train departs Chicago Union Station at 6:00 AM, arriving in downtown Milwaukee at



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Amtrak has both the Hiawatha and Empire Builder service in the Corridor.

7:29 AM. Service is provided every two to three hours until the last train leaves Chicago at 8:05 PM. Southbound service begins with a train leaving Milwaukee at 6:15 AM and arriving in Chicago at 7:57 AM. The last *Hiawatha* train leaves Milwaukee at 7:30 PM. One-way fares between Milwaukee and Chicago are \$20 and round trips \$40. For frequent travelers, multi-ride rates of \$150 for a 45-day-ten-ride ticket and \$325 for monthly passes are also available. In 2004, *Hiawatha* service posted the best on-time performance in the Amtrak system, at 93%. Trains do not turn around in Milwaukee or Chicago, but rather operate in a push-pull mode. The consists typically are a single diesel-electric locomotive at one end, three or four single-level passenger cars, and a control car at the other end. The control car is normally an older locomotive that has been retired from service and converted into a dual-use cab and baggage car. That combination allows train crews to use the cab and train controls at the front of the train when the locomotive is pushing from the rear.

As noted above, *Hiawatha* trains do not serve the cities of Racine and Kenosha; the CP alignment runs approximately five miles west of those cities through Sturtevant, Wisconsin. *Hiawatha* trains do, however, connect to Milwaukee's General Mitchell International Airport at the Milwaukee Airport Rail Station (MARS), which opened in January 2005. Located in airport remote parking area "B," shuttle buses meet arriving *Hiawatha* trains, and bring connecting air passengers and employees from the terminal to the rail station. The MARS includes a 267-vehicle parking lot with hourly and daily rates.

Amtrak's daily *Empire Builder* also operates between Milwaukee and Chicago. It provides long-distance passenger service between Chicago Union Station and Seattle, Washington and Portland, Oregon. In the KRM corridor, the trains stop only at Chicago, Glenview and Milwaukee. Empire Builder trains operate once daily in each direction. Northbound



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Amtrak also has connecting bus service in Wisconsin

service departs Chicago at 2:15 PM and arrives at Milwaukee's downtown station at 3:55 PM. Southbound trains leave Milwaukee at 2:00 PM and arrive at Chicago Union Station at 3:40 PM. Passenger seating on the *Empire Builder* is reserved, and the trains offer many amenities associated with long-distance rail travel, including checked baggage service at the Milwaukee and Chicago stations, dining car service and a lounge car. Travel time on the *Empire Builder* service between Milwaukee and Chicago is 1 hour and 40 minutes. Train consists typically are two or three diesel-electric locomotives pulling a few baggage cars and perhaps 10 to 15 double-deck passenger cars. Since the *Empire Builder* is a long-distance train, only passengers with reserved seats and destinations outside the Milwaukee-Chicago corridor are allowed to board the train.

Amtrak also offers connecting bus service from Milwaukee to Oshkosh and Wausau, Wisconsin, via its "Thruway Connecting Service." A daily, single round trip is operated by Lamers Bus Lines using conventional over-the-road motorcoach buses with seating for 50-55 passengers. The service comes south with passengers to connect with the 3:00 PM southbound *Hiawatha* and similarly picks up passengers from the 2:29 PM arriving train from Chicago.

Bus distribution transportation from the Amtrak Depot in downtown Milwaukee is provided by the Milwaukee County Transit System, as described in a later section. It includes one line serving the Depot directly and several others within a four-block walk.

Metra Commuter Rail Service

The service mark *Metra* applies to the Commuter Rail Division of the Northeastern Illinois Regional Transportation Authority (RTA), which covers six Illinois counties, two of which border Wisconsin. Metra is one of three transit operating agencies which fall under the RTA umbrella. The other two are the Chicago Transit Authority (CTA), which is responsible for



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*Metra provides
commuter rail
service between
Chicago and
Kenosha*

rapid transit and bus service in Chicago and neighboring suburbs, and Pace, which is responsible for suburban bus service. Metra's responsibilities include the direct operation of commuter rail service on seven lines and coordination of operations of privately operated rail service on four lines through Purchase of Service Agreements (PSA). One of these PSA routes is located within the study area.

The Metra's Union Pacific North Line offers commuter rail service between Kenosha and the Ogilvie Transportation Center (OTC) in downtown Chicago. The route is 51.6 miles long with 26 stations, including OTC. Metra uses diesel-electric locomotives, which push (inbound) and pull (outbound) between four and eight gallery-style passenger coaches. Coaches seat an average of 150 passengers each. The present timetable of service includes 62 weekday trains (running in both directions, the equivalent of 31 round trips), 22 Saturday, and 16 Sunday/holiday trains. Weekday peak period schedules include a mix of trains which run on express and local (i.e., making all stations stops) service. Weekday off-peak and weekend trains generally operate on an all-stop basis.

In addition, many trains operate only as far north as Waukegan, Illinois, which results in comparatively lower levels of service to the three stations north of Waukegan: Zion and Winthrop Harbor, Illinois, and Kenosha, Wisconsin. Metra has 50 trains between Waukegan and Chicago, compared to 18 between Kenosha and Chicago. With the exception of one late morning 2-hour space, the Waukegan service is a minimum of hourly service, compared to gaps as long as 6-hours (8:49 AM to 2:49 PM) for Kenosha.

Kenosha is the only commuter rail stop on Metra operated lines outside the Illinois-legislated RTA six-county area. It is in Metra's system because it was a pre-existing condition when the RTA was created in the 1970s.



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Table IV-3 presents summary schedule information for five UP stations. As can be seen, service is designed primarily to accommodate riders employed in downtown Chicago. For example, the first outbound train arrives in Kenosha at 8:15 AM, which may be too late for some workers, especially those with work sites more removed from the Kenosha Station.

TABLE IV-3. METRA UP-NORTH WEEKDAY SCHEDULE PROFILE FOR SELECTED STATIONS

	Kenosha	Waukegan	Highland Park	Davis St. Evanston	OTC
Miles to OTC (Chicago)	51.5	35.9	23.0	12.0	0.0
Station Stops per Day	18	50	54	58	62
1st Inbound Train Time	5:55 AM	4:58 AM	5:22 AM	5:49 AM	6:15 AM
1st Outbound Train Time	8:15 AM	7:51 AM	7:26 AM	6:43 AM	6:24 AM
Minutes to OTC – AM fastest	84	57	35	21	--
Minutes to OTC – local	100	75	50	26-28	--
Avg. Speed to OTC – fastest	36.7 mph	37.8 mph	39.4 mph	34.3 mph	--
Avg. Speed to OTC – local	30.9 mph	28.7 mph	27.6 mph	26.7 mph	--

OTC=Ogilvie Transportation Center

Metra service primarily accommodates commuters to Chicago.



DEFINITION OF ALTERNATIVES

Private bus lines provide intercity and airport connections, and commuter service.

Metra fares are based on travel between designated fares zones, which are set at 5-mile increments starting at each line's downtown terminal station. A one-way fare is set at a base amount (\$1.95, effective February 2006) and increases by \$0.40 or \$0.45 for each zone boundary crossed. The resulting one-way fare for Kenosha to Chicago is \$6.40 or \$172.80 monthly. Monthly and ten-ride tickets are also offered and include discounts relative to the cost of using one-way tickets. Metra riders also have the option of a \$5 weekend ticket, which provides unlimited use of the Metra system for a given weekend.

Existing Intercity and Commuter Bus Service

Four private companies provide intercity bus transit service in the study corridor, with varying focuses for that service. Wisconsin Coach Lines serves the corridor with commuter buses and airport connections. Greyhound Bus Lines provide long-distance buses connecting Milwaukee and Chicago, with stops in Racine and Kenosha Counties. Megabus.com provides Chicago to Milwaukee intercity bus service with no intermediate stops. Badger Bus Lines runs commuter buses in the northern portion of the study area, connecting downtown Milwaukee and Mitchell Airport with points west in and beyond the Milwaukee and Madison areas.

Wisconsin Coach Lines

Wisconsin Coach Lines (WCL) provides two services in the KRM corridor: a commuter service and airport connections using conventional over-the-road motorcoach buses with seating for 50-55 passengers. The commuter route operates between the Milwaukee Greyhound depot and other downtown locations (but not the Amtrak Depot), Mitchell Airport, Oak Creek, Caledonia, the City of Racine, Carthage College and the City of Kenosha. On weekdays, eight runs are operated in each direction while four runs are operated on Saturdays, Sundays and holidays. Intermediate stops are made along the route at major rural and suburban intersections, at local transit system hubs in the major cities served, and at additional



DEFINITION OF ALTERNATIVES

Wisconsin Coach Lines is the dominant commuter bus line in the corridor.

rural locations upon passenger request. Travel time between downtown Kenosha and downtown Milwaukee on WCL commuter buses is approximately 90 minutes.

Fares are based on a zone system with one-way fares ranging from \$1.00 to \$4.00. Ten-ride passes are available offering a 10% discount for regular travelers; seniors receive a 50% discount, and students ride for \$1 on all regular routes regardless of zone boundaries. In the City of Racine, WCL buses stop at the Transit Center, where connections may be made to the Belle Urban System using WCL transfer slips as a valid transfer to the local system.

WCL commuter bus route alignment from downtown Milwaukee is:

- East on Wisconsin Avenue
- West on I-794
- South on I-94
- East on STH 119 (airport spur) to Mitchell International Airport
- South on Howell Avenue
- West on Ryan Road/STH 100 to the I-94 interchange bus stop, then East to STH 32
- South on STH 32 to the Kenosha Metra station (with an intermediate stop at the Racine Transit Center)
- East on 54th Street (with a stop at the Kenosha Transit Center), South on 7th Avenue, West on 58th Street, South on Sheridan, West on 60th Street and South on 22nd Street to Global Travel.

WCL passengers requiring Americans with Disability Act (ADA) accessible vehicles must provide 24 hour advanced notice.

The WCL airport bus service connects the Milwaukee Amtrak Depot, General Mitchell International Airport (GMIA), Racine and Kenosha, stopping at interchanges on I-94, O'Hare International Airport, and



DEFINITION OF ALTERNATIVES

Greyhound, Badger Bus and Lamers reach out from the corridor to other cities.

Chicago's Midway Airport. Buses operate hourly from approximately 4 AM to midnight. Fares range from \$11 for Waukesha to GMIA to \$70 for the longest trip, which is Waukesha to Midway.

Greyhound

Greyhound Bus Lines runs 20 bus trips daily (10 each way) between Milwaukee and Chicago using conventional over-the-road motorcoach buses with seating for 50-55 passengers. Two of those roundtrips – one in the morning and one in mid-afternoon – make an intermediate stop in Kenosha, at a station located at 2105 W. Roosevelt Road, at the intersection of Roosevelt Road, 63rd Street and 22nd Avenue. This location is approximately one mile south and west of the Kenosha Metra Station. Travel time on Greyhound Bus Lines between Kenosha and Milwaukee is 50 to 55 minutes. One-way fare between those cities is \$9.50; roundtrip fare is \$18.00.

Badger Bus and Lamers Bus Lines

Badger Bus Lines operates six buses daily between Milwaukee and Madison, Wisconsin using conventional over the road motorcoach buses with seating for 50-55 passengers. Within the KRM study corridor, five of those buses operate between downtown Milwaukee and General Mitchell International Airport between 8:30 AM and 10:30 PM. One additional evening bus operates Sundays when the University of Wisconsin at Madison is in session. Fare between Mitchell Airport and downtown Milwaukee is \$6 one way and \$10 for a round trip. Travel time between these stations is approximately 25 minutes. The buses stop at the Badger Bus Depot on N. James Lovell Street (N. 7th Street) in downtown Milwaukee; parking is available at a rate of \$6.25 per day.¹⁰

¹⁰ See www.badgerbus.com



DEFINITION OF ALTERNATIVES

Megabus is a new economic Milwaukee-Chicago direct bus services.

Fixed-route local buses serve the city of Kenosha and surrounding area.

Lamers Bus Lines provides two buses (one each way) connecting the Amtrak Depot in Milwaukee to Wausau and other points in central and northern Wisconsin. The service is scheduled to coincide with Amtrak's *Hiawatha* service departure from Milwaukee at 1:50 PM and arrival at 2:37 PM.

Megabus

In April 2006, megabus.com started a low-priced, express intercity bus operating single stops in Chicago and Milwaukee. There are no ticket agents or bus stations. All advanced sales are by internet with ticket prices ranging from \$1 to \$8 one way depending on available seating. Boarding is curbside at Chicago Union Station and Milwaukee Amtrak Station. There are no intermediate stops.

Urban Bus and Streetcar Services

There are three urban bus or bus/streetcar services in the corridor:

- Kenosha Area Transit (KT), operated by the City of Kenosha
- Belle Urban System (BUS), operated by the City of Racine
- Milwaukee County Transit System (MCTS), operated by Milwaukee County

Kenosha Area Transit (KT)

Fixed-route local transit service in the City of Kenosha and surrounding area is provided by the City of Kenosha using conventional 30- to 40-foot urban buses with 30-40 passenger seats. The current service has ten fixed bus routes. The routes are radial in design and focused on downtown Kenosha, thus providing direct, non-transfer service from the central business district (CBD) to all areas of the city and immediate environs, including the University of Wisconsin-Parkside campus where riders may transfer to Racine's bus system.

Among the major destinations served by transit are Carthage College, St.



DEFINITION OF ALTERNATIVES

In addition, a streetcar system provides connections between the rail station, downtown and new developments in Kenosha.

Catherine's Hospital, the downtown shopping district and Civic Center, Lakeview Corporate Business Park, area high schools and major shopping centers such as the Lakeside Outlet Mall and Southport Plaza. Buses operate Monday through Friday from 6 AM to 7:30 PM and from 6 AM to 6 PM on Saturdays. The regular cash fare is \$1.00.¹¹

Kenosha Streetcar

Since June of 2000 Kenosha has operated a nearly two-mile long, heritage streetcar loop connecting the Metra commuter rail station with downtown Kenosha and the Harborfront area. Harborfront is a new redevelopment of a former Chrysler auto plant on Kenosha's Lake Michigan waterfront. The line reflects the operation of streetcars in the city in the early 20th century and uses restored Presidents' Conference Cars (PCC) streetcars originally built in 1951 that are painted in the historical colors from five other cities of the eastern US and Canada.

The system is a single-track loop, 1.7 miles long, which runs from the Metra station eastward to a park on the tip of a peninsula about 3/4 mile away. The streetcar runs in a median for about half its length, alongside the street for about 1/4 of its length, and in the street for the remaining distance. In addition to serving the railroad station and Harborfront, it passes municipal buildings, the library, a retail district, and the Kenosha Public Museum. A maintenance facility is located on the line, and is adjacent to a bus transfer center where Kenosha Area Transit has a terminal. Five ex-Toronto streetcars were purchased and rehabilitated for the electrified line. Simple passenger stops are located about every two blocks. The line is handicapped accessible.¹²

¹¹ <http://www.kenosha.org/departments/transportation/index.html>

¹² <http://www.heritagetrolley.org/existKenoshaOverview.htm>



DEFINITION OF ALTERNATIVES

The Belle Urban System (BUS) system provides bus service in Racine out of a new transit center adjacent to the old railroad station, which is being restored. BUS operates pulsed service.

The Kenosha Streetcar operates every 15 minutes, Monday through Saturday, from about 11 AM until about 7 PM. Reduced operating hours are in effect during the winter months. The fare is \$0.25. The Streetcar is owned and operated by the KT, the department of the city that provides bus transit service throughout the community.¹³

The Belle Urban System (“the BUS”)

The City of Racine operates the BUS using conventional 30- to 40-foot urban buses with 30-40 passenger seats. The service provides 11 regularly scheduled fixed routes that cover the Racine urbanized area. Service is provided to the City of Racine, the villages of Mt. Pleasant and Sturtevant, the town of Yorkville, and the University of Wisconsin-Parkside campus.

Service is provided from 5:30 AM to midnight on weekdays, 5:30 AM to 10:30 PM on Saturdays, and 9:30 AM to 7:00 PM on Sundays. Headways during weekdays are 30 minutes or one hour, depending on the route. Most weekend service is hourly.

All of the BUS routes meet and depart out of a new Transit Center in downtown Racine. This central transfer point was constructed just east of and adjacent to, the original Racine railroad station on the UP Kenosha Subdivision. The railroad station is currently unused but is being restored by the City of Racine for future development and possible use as a commuter rail station which would connect to the Transit Center. Wisconsin Coach Lines also operates from the Center.

From the Transit Center the BUS routes radiate to serve many destinations in the area, including civic buildings such as City Hall, the Public Library and the County Courthouse; business destinations like SC Johnson, CNH

¹³ <http://www.kenosha.org/departments/transportation/>



DEFINITION OF ALTERNATIVES

and Modine Manufacturing; shopping malls and the downtown retail district; entertainment and cultural fixtures such as the Racine Art Museum, the Racine Zoo, the Regency Mall cinema and numerous parks. In addition, two routes (7 and 27) serve the Sturtevant Amtrak station, and Route 9 serves the University of Wisconsin-Parkside campus, where riders may transfer to the Kenosha Transit System Route 1 and connect to points served by the KT system. Regular adult fares are \$1.25 per ride, \$40 monthly, and \$2.50 on weekends. A ten-ride pass is available for \$11, and special fares apply to children, seniors and people with disabilities.

During summer months, the BUS also operates two trolley buses in the downtown area between Memorial Day and Labor Day. One vehicle runs from Tuesday through Sunday from 10:00 AM to 4:00 PM. On Friday and Saturday, the Pub and Grub service runs in the downtown area from 4:00 PM to midnight. The fare at all times is \$0.25 per ride. The service provides downtown shuttle service for marina visitors, area residents and downtown workers to restaurants, pubs, the art district, the library, museums and other downtown attractions. On Friday and Saturday evenings, the Pub and Grub service provides transportation to more than 15 downtown restaurants, numerous pubs and taverns and two theaters.¹⁴

Milwaukee County Transit System

Milwaukee County is the major provider of transit services in Milwaukee using conventional 30- to 40-foot urban buses with 30-40 passenger seats. The Milwaukee County Transit System (MCTS) is the largest Wisconsin public transit system in the KRM study area; MCTS operated over 23.5 million revenue miles of bus service in 2003.¹⁵

*MCTS is the
Milwaukee County
bus agency.*

¹⁴ <http://racinetransit.com/trolley.aspx>

¹⁵ Data from 2003 (draft) data from the National Transit Database.



DEFINITION OF ALTERNATIVES

MCTS operates 29 local and 10 express bus routes.

MCTS operates extensive fixed-route bus service throughout Milwaukee County, as well as surrounding areas. Eighty-five percent of county residents live within one-quarter mile of a bus stop. The service primarily consists of two basic types of routes: local bus routes and Freeway Flyer bus routes operating principally over the freeway system.

Twenty-nine local bus routes are operated seven days per week from early morning until late evening. Service is generally organized on a grid pattern to maximize coverage and connectivity. In addition, numerous routes travel through the central business district (CBD). One route serves the Milwaukee downtown Amtrak Depot directly, and several routes have stops located within four blocks of the Depot, particularly east-west along Wisconsin Avenue and north-south along the N. 2nd Street and N. Plankinton Street couplet. The regular full fare is \$1.75. During the summer months, the "Milwaukee Trolley Loop" circulates through downtown Milwaukee and the city's lower east side, serving major tourist destinations and entertainment districts. Using rubber-tired vehicles with a distinctive "trolley" design, the service is designed to appeal to visitors and conventioners.

MCTS's ten Freeway Flyer routes serve park-and-ride lots throughout Milwaukee County and the central business district, providing commuter service during weekday peak periods principally in the peak direction of travel to or from downtown Milwaukee. In addition, MCTS operates out-of-county express routes, such as the Ozaukee County Express which brings passengers from Ozaukee County to the CBD and shuttles city workers to employment centers in Washington and Waukesha Counties. MCTS also provides special event bus service to major events such as Summerfest, Milwaukee Brewers baseball games, and the State Fair. In 2004, MCTS ridership for such special service was over 593,000 trips while overall total system ridership was 58,200,000.



DEFINITION OF ALTERNATIVES

Railroad Infrastructure

There are several railroad and abandoned interurban rail corridors in the area.

One of the resources that can be used in selecting transit alignments is existing railroad ROW. They differ from roads and highways in that railroad lines may have been reduced, or rationalized, over the years from multiple tracks to perhaps only a single track with passing sidings. In some cases, the railroad may even have been abandoned, leaving an unused ROW. This reduction in railroad capacity can be a significant resource in creating transit alternatives, whether it is a busway on an abandoned right of way, or the reconstruction of tracks that once provided heavier service. As a result, a separate inventory of railroad infrastructure is needed as a baseline to the selection and definition of the various alternatives. At one time, as many as 51 regularly scheduled trains were operated each day in the KRM corridor. Currently, Amtrak operates intercity service between Milwaukee and Chicago, and Metra operates limited commuter service between Chicago and Kenosha. Existing railroad infrastructure is shown in Figure IV-1.

Historically, the Kenosha-Racine-Milwaukee corridor has been well served by rail transit. Until the early 1960s, three private railroads carried passengers along the shore of Lake Michigan between Milwaukee and Chicago and a fourth service, an interurban line, also operated before that. Three of those passenger services operated through the cities of Racine and Kenosha.

The UP Kenosha Subdivision is centrally located in the corridor.

The first of these was the Chicago & North Western Railway (CNW), which is now operated as part of the Union Pacific (UP) Railroad. The CNW line along the lakeshore was the double track mainline of the railroad and carried some of the fastest steam-powered passenger trains in the country on their trips from Chicago to Minneapolis. That line has since been rationalized to a single track with passing sidings and now carries only freight service, primarily unit trains of coal to the power plants



DEFINITION OF ALTERNATIVES

in the area. It is now operated by the UP as its Kenosha Subdivision. Several of the passenger station buildings along the line still exist.

Another passenger railroad servicing the KRM cities was the Chicago, North Shore & Milwaukee. That railroad has since gone out of service and the rights of way abandoned. Its alignment was less than a mile west of the UP Kenosha Sub in Racine, but further north on the line it was further west of the Kenosha Sub, crossing the Milwaukee Sub (see below) west of Oak Creek until it was closer to the CP alignment, passing west of what is now the General Mitchell International Airport. Parts of that ROW in Racine County have been converted into a horse trail that is owned by a conservancy, while portions in Milwaukee County are now off-street paved portions of the Oak Leaf (bicycle) Trail.

The Milwaukee Electric Railway & Light Company operated interurban service from Kenosha to Milwaukee along a right of way that was east of and parallel to the Kenosha Sub. This parallel alignment extended to Oak Creek where the line departed to the west and ran north parallel to the Milwaukee Sub (see below) on the east side of the current airport to Cudahy. From there, the alignment again diverted to the west to make a straight north entrance into Milwaukee.

A fourth passenger service in the corridor was about five miles west of the lakeshore cities in the KRM Corridor. This intercity service was originally provided by the Chicago, Milwaukee, St. Paul & Pacific Railway, or Milwaukee Road, and competed heavily with CNW service between Chicago and Minneapolis with steam-hauled passenger trains that would, on occasion reach 100 mph. Originally a high-speed double-track railroad over almost its entire distance, it too has been rationalized to a single track with passing sidings west of Milwaukee. The line is now owned by

The interurban lines in the area went out of business long ago.

The CP is a heavily used double track mainline but in the western side of the corridor.



DEFINITION OF ALTERNATIVES

The UP Milwaukee Subdivision is between the CP and the UP Kenosha Subdivision.

The FTA has a definition for the No-Build alternative.

the Canadian Pacific Railway, still carries Amtrak trains, and is the proposed alignment for high-speed rail in the Midwest, as discussed below.

Finally, the CNW had a freight line, called “the New Line,” through the corridor. The line is now also part of the UP system and is known as the Milwaukee Subdivision. The UP’s Milwaukee Sub runs parallel to and between its Kenosha Sub and the CP, angling slowly from the CP over to the Kenosha Sub until it joins the Kenosha Sub at St. Francis.

2. No-Build Alternative

The FTA Planning and Project Development Guidelines state that a No-Build Alternative can be defined in one of two ways:¹⁶

1. An alternative that incorporates “planned” improvements that are included in the fiscally constrained long-range plan for which the need, commitment, financing, and public and political support are identified and reasonably expected to be implemented, or
2. A conservative definition that adds only “committed” improvements – typically those in the annual element of the transportation improvement program or local capital programs – together with minor transit service expansions and/or adjustments that reflect a continuation of existing service policies into newly developed areas.

The KRM No-Build Alternative utilizes the latter of these two definitions and incorporates selected planned and programmed public transportation and system management improvements described in the regional Transportation Improvement Program (TIP).¹⁷ Since there are no major highway or transit capital improvements identified for the corridor in the TIP, the KRM No-Build Alternative essentially reflects current conditions.

¹⁶ *Op. cit.* SEWRPC TIP, December 2003.

¹⁷ *Ibid.*



DEFINITION OF ALTERNATIVES

The regional Transportation Improvement Plan is the basis for Programmed Improvements.

A number of public highway improvements are programmed in the region and will be implemented by 2035

The previous sections on Major Highways, Existing Transit and Railroad Infrastructure provide a description of the existing transportation infrastructure. The No-Build Alternative maintains the current transportation system plus transit and roadway improvements committed for implementation through the year 2035. The committed projects included in this No-Build are assumed in all other alternatives. The No-Build Alternative also serves as the baseline for analyzing environmental impacts.

Programmed Improvements

The TIP¹⁸ documents the programmed improvements throughout the region through 2006. It is considered the financially constrained program for the region. That is, all projects listed include identified funding sources, and, as such, it is reasonable to expect each of the projects to be fully implemented by 2035, the planning horizon for the Alternatives Analysis. These projects, some of which are under construction or recently completed, together with the existing transportation facilities and services, collectively define a future No-Build Alternative against which the AA/DEIS alternatives are compared for environmental impact assessment purposes. It also satisfies NEPA requirements for a “do-nothing scenario,” as a way to gauge the implications of not initiating any new transportation improvements in the KRM corridor. The No-Build projects affecting the corridor are briefly summarized below.

Selected Highway Improvements¹⁹:

- Reconstruction with additional traffic lanes of STH 100 from Howell Avenue (STH 38) to STH 32 in the City of Oak Creek (2.75 miles)

¹⁸ *Op. cit.* Regional Planning Commission TIP, December 2003.

¹⁹ *Ibid.*



DEFINITION OF ALTERNATIVES

Public transit projects are also identified in the TIP.

Other related transit projects which are not in the TIP are also under construction.

- Reconstruction with additional traffic lanes of STH 32 from Three Mile Road to Four Mile Road in the Town of Caledonia (1.25 miles)
- Reconstruction with additional traffic lanes of STH 32 from Five Mile Road to North County Line in the Town of Caledonia (3.37 miles)
- Reconstruction with additional traffic lanes of STH 11 from the Village of Sturtevant eastern village limits to STH 31 (2.0 miles)

Selected Transit Improvements²⁰:

- Construction of a new transit operating and maintenance facility for Kenosha Transit
- Replacement buses for Kenosha Transit
- Reconstruction and expansion of the Metra train station in Kenosha
- Construction of an overflow parking lot for the Metra train station
- Replacement buses for MCTS
- Replacement of fueling systems at MCTS operating garages
- Renovation and repairs at the Fond du Lac Avenue and Kinnickinnic Avenue operating garages

Other Transit improvements which are known to be under construction include:

- Construction of a new Amtrak station in Sturtevant almost ½ mile south of the current station and just south of Durand Road
- A new \$15.2 million architectural plan to rebuild Milwaukee's Amtrak Depot was unveiled by the city in September 2005. The renovation work is scheduled to be completed by April 2007 and will transform the Depot into the Milwaukee Intermodal Station for Amtrak, Greyhound bus, and other transit connections. It will also have improved waiting areas, office space, food service and other passenger amenities.

²⁰ *Ibid.*



DEFINITION OF ALTERNATIVES

Environmental enhancements are also identified in the TIP.

- Metra is about to start construction of a multi-year bridge replacement program on the UP-North line. The project involves replacing 22 aging bridges between mileposts 3.0 and 10.6 north of the Ogilvie Transportation Center. The project will improve train traffic flow and pedestrian safety. The grade of the two tracks will be realigned to allow greater clearances under the bridges. The horizontal realignment will result in a space for the original Chicago and North Western Railroad third track so that an express track could be installed in the future. Signaling will be improved to allow for more flexible and frequent operations.

Environmental Enhancements²¹:

- Construction of sidewalks and landscaping along Sheridan Road (STH 32) from southern city limits to 85th Street in the City of Kenosha
- Construction of a pedestrian bridge over STH 32 at Carthage College
- Landscaping of Main Street (STH 32) from State Street to 7th Street in downtown Racine
- Construction of a bicycle/pedestrian trail on the former CP corridor from STH 31 to Willow Road in Racine County.

Planned Improvements Not Included in No-Build

Many other projects have been planned for the area but do not have “committed” construction funding or cannot yet be considered “reasonably expected to be implemented”²² so are not included in the No-Build. The progress on these plans and specific projects will be monitored for their impact on the KRM project as it matures. They are briefly described here as a reference for future studies.

²¹ *Ibid.*

²² *Op. cit.*, FTA, Part I, Planning and Project Development Guidelines



DEFINITION OF ALTERNATIVES

A number of public transportation improvements are being discussed, but are not yet funded.

- The Regional Planning Commission has completed a Transportation System Plan for the year 2025²³ and is working on an update for the year 2035.²⁴ This is the most logical source for identifying transportation improvement projects in the region.
- The Commission studied southeast Wisconsin's freeway system from 2000 to 2003 and recommended full reconstruction of the I-94 corridor between 2009 and 2016. In June and August WisDOT selected consultants for the I-94 North-South Corridor Analysis and for assistance in the engineering and design of Kenosha/Racine interchanges on I-94.
- Plans have been made to triple the length of the Kenosha Streetcar system "The new lines would serve the downtown areas and would connect another brownfield site that is scheduled for redevelopment. Developer interest in Kenosha is strong and the expanded streetcar line will, as in so many other cities, be a significant factor in spurring redevelopment."²⁵
- Plans for a Midwest Regional Rail System of high-speed passenger rail service have been studied over the past decade by a consortium of several state departments of transportation. The most recent study²⁶ proposes 17 daily roundtrips of 110-mph high-speed train service between Chicago and Milwaukee. This service is planned to operate on Amtrak's current alignment on the CP Railway.

²³ *Op. cit.* Review and Reaffirmation...and Extension of Plan Design Year to 2025, Regional Planning Commission, April 2003.

²⁴ A Regional Transportation System Plan for Southeastern Wisconsin: 2035, Regional Planning Commission Planning Report No. 49, Final Draft, May 2005.

²⁵ From <http://www.heritagetrolley.org/existKenosha.htm>

²⁶ Midwest Regional Rail System, Executive Report, September 2004, <http://www.heritagetrolley.org/existKenosha.htm>.



DEFINITION OF ALTERNATIVES

3. Transportation System Management (TSM) Alternative

The FTA Planning and Project Development Guidelines state that a TSM Alternative must be defined as the “best that can be done” to address the identified problems in the corridor without major capital investment in new infrastructure, such as constructing a new transit running way or “guideway.”²⁷

The projects defined in the KRM TSM Alternatives do not require major capital investment, but can significantly improve public transportation.

The KRM TSM Alternative utilizes existing commuter rail, streetcar and bus service throughout the corridor in a cost-effective manner that does not require major capital investment, including improved operations and increased park-and-ride capacity in strategic locations. The TSM Alternative represents a level of capital investment that is greater than the No-Build Alternative but substantially less than any Build Alternative, and as such will include improvements such as the following:

- Increased levels of existing transit service, primarily within the STH 31/32 corridor(s), but also connecting the corridor with Chicago
- Improvements aimed at enhancing transit service across the Wisconsin/Illinois state line and expanded parking at key station locations
- Addition of signal priority systems for existing bus service at selected signalized intersections
- Addition of park-and-ride lots through lease or construction
- The formation of Transportation Management Associations (TMAs) to enhance employer awareness and support of congestion mitigation strategies
- Addition of passenger information systems at major transfer locations to inform riders of the real-time wait for the next bus.

²⁷ Ibid.



DEFINITION OF ALTERNATIVES

The TSM Alternative proposes an expansion of inter-city bus service in the corridor and some additional railroad service from the southern end of the corridor.

The alignments chosen by the public and private bus companies in this area are assumed to be based on the twin goals of maximizing ridership and minimizing travel time, or sometimes trade-offs between them. During the site visit, the study team found no reason to doubt those alignment choices or to suggest changes in the bus routes.

There is no cost-effective way to increase speeds along the existing STH and local roadway alignments because of curves and surrounding development.

The main elements of the TSM Alternative are:

- Expansion of existing Wisconsin Coach Lines intercity bus service
- Expansion of existing MCTS Route 48 (South Shore Flyer) service
- An additional Metra reverse peak direction train trip in each peak period to/from Kenosha.

The primary thrust of the set of TSM recommendations involves building on the regional bus routes that already serve the corridor. Selected trips will be extended to Waukegan to connect to the roughly-hourly service portion of Metra's UP-North commuter rail line. The frequency of the existing Wisconsin Coach Lines inter-city service between Kenosha and downtown Milwaukee will be increased, resulting in limited stop service with stops at Kenosha, Somers, Racine, Caledonia, Oak Creek, Mitchell International Airport and Downtown Milwaukee. This pattern of stations is roughly comparable to the stops proposed for the rail and rail/bus alternatives in the 2003 KRM study and accepted for use in this work for both BRT and Commuter Rail Alternatives.

This service will operate primarily along STH 32 south of Oak Creek. Select trips of this expanded inter-city service could be extended south to Waukegan to connect to more Metra train service. However, that option was deferred for later consideration in the Build Alternatives when it could



DEFINITION OF ALTERNATIVES

*The TSM
Alternative also
includes facility
improvements*

be leveraged to better advantage with the possible addition of new Metra trains to Kenosha.

The frequency of the MCTS Route 48 (South Shore Flyer) service will also be increased on its limited-stop service between Hwy 100 (Oak Creek) and downtown Milwaukee with stops at South Milwaukee and Cudahy/St. Francis. Reverse commute runs will also be added to the current peak-direction only service.

These two commuter bus route improvements are the core of proposed TSM service improvements. The expanded inter-city service will tie together the three public operating entities that presently serve Kenosha, Racine and Milwaukee. Select local routes will also be modified through new alignments, service frequencies and/or span of service in support of the TSM Alternative.

The TSM facility improvements provided for these two lines are:

- Oak Creek Park-and-Ride Lot at Hwy 100 and STH 32: The TSM Alternative assumes that land will be purchased and an off-street park-and-ride facility and transit center will be constructed at this location, for use by Wisconsin Coach Lines and MCTS Route 48 service.
- A Cudahy/St. Francis Transit Center: A transit facility with shelters is assumed on Kinnickinnic Avenue, immediately north of Layton Avenue. This facility is proposed to accommodate bus transfers. Cudahy currently owns land in this area which can be used for a park-and-ride lot associated with this transit center.
- Traffic Signal Prioritization: Signal improvements are assumed along STH 32 to reduce traffic signal delays for Wisconsin Coach Lines service in Kenosha and Racine Counties, and in south Milwaukee



DEFINITION OF ALTERNATIVES

Additional features are expected to make the expanded commuter bus service more attractive to riders

County. In addition, signal improvements are assumed along N. Chicago and S. Packard to reduce traffic signal delays for MCTS Route 48 service.

The expanded routes may also include complementary features to increase the attractiveness of the services. These features include:

- Feeder buses – a network of local buses to feed riders to and distribute riders from regional line-haul services;
- Integrated Fares – allowing riders to transfer from one system to another for free or for a very modest fee. The application of smart card fare collection technology could also be included to allow linked trips between transit properties;
- Transportation Management Associations (TMAs) - non-profit, public/private partnerships to provide commuter information and transportation services in a particular area, typically an employment center. Some example activities of TMAs include promotion of the sale of discounted transit fare media at the work place, coordination of start/quit times of employers to mesh with transit service times, subsidization of connecting transit services, and lobbying for public transportation investments.

All of the alternatives considered in this study will rely on park-and-ride lots to provide opportunities for riders to use the new transit system and also rely on the public bus systems in Kenosha, Racine and Milwaukee to collect riders. At destination stations, these bus systems become even more important, particularly in Milwaukee. The MCTS services will be used in the ridership models to distribute arriving passengers during the morning peak. Should funding for the Milwaukee Connector project become committed during a phase of the KRM work, its improved circulation characteristics will also be included in the modeling.



DEFINITION OF ALTERNATIVES

Bus Rapid Transit (BRT) systems operate on special rights of way without traffic disruptions.

The TSM Alternative assumes one early morning and one late afternoon train are added to the Metra schedule between Kenosha and Chicago. The morning northbound train will connect in Kenosha with a commuter bus departure that arrives in Milwaukee before the start of the business day. Similarly, an afternoon bus leaving Milwaukee after the business day will connect in Kenosha with the new southbound Metra train destined for Chicago.

The complete combination of facilities, bus service and Metra service improvements in the TSM definition are shown in **Figure IV-4**.

Fare structures will be comparable with and based on current fare policies.

This is a preliminary description of the TSM. Refinements on this alternative may be made as the project progresses.

4. Bus Rapid Transit (BRT) Alternative

The Bus Rapid Transit (BRT) Alternative builds and improves upon the TSM Alternative. TSM buses operate in mixed traffic and experience congestion arising from two-lane roads, automobile traffic and traffic signal delays. In contrast, the goal of a BRT system is for buses to operate without traffic disruptions on some combination of newly defined or added high-occupancy vehicle (HOV) lanes or exclusive bus lanes.



DEFINITION OF ALTERNATIVES

FIGURE IV-4. SELECTED TSM IMPROVEMENTS





DEFINITION OF ALTERNATIVES

Four options have been identified for the BRT Alternative in the region.

Two BRT options run on freeways.

The KRM BRT Alternative is defined based on guidance provided for similar alternatives in the FTA's BRT guideline report.²⁸ The alternative is intended to provide a level of public transportation service throughout the corridor that is (1) reasonably comparable to, and competitive with, commuter rail and (2) as safe, convenient and cost-effective as possible. BRT service under this alternative will be coordinated with the existing Metra commuter rail service to and from Kenosha.

The BRT Alternative assumes the identification of traffic lanes which will facilitate rapid bus movement through the study area. Under various options, these lanes may be created by improving existing streets, adding new lanes, using other existing transportation rights of way or creating whole new rights of way. Traffic restrictions may also be used in combination with infrastructure improvements, including limiting lanes to bus and high-occupancy vehicles (HOV) use or designating them as exclusive busways.

As discussed earlier, the Commission's 1981 Transit Technology report identified four possible BRT Alternative Options for the region.

1. Mixed traffic on freeways
2. Reserved lanes on freeways
3. Exclusive busways
4. Reserved lanes on surface arterial streets²⁹.

The first two of these options indicate that maximum use should be made of the existing freeway system. Indeed, both of the BRT Alternative Options pursued in this study did utilize the only freeway in the corridor, I-794 and its southern extension, STH 794, Lake Parkway. Under those conditions, buses can run at 55 to 65 mph and provide run times comparable to those of rail service.

²⁸ FTA, Characteristics of Bus Rapid Transit Decision-Making, August 2004.

²⁹ *Op. cit.*, Commission, 1981, page 230.



DEFINITION OF ALTERNATIVES

Exclusive busways depend on funding a right-of-way.

The reserved lane option uses existing arteries but offers more modest advantages than the other BRT options.

But the I-794/STH 794 system reaches only approximately six miles of the 34 miles from Milwaukee to Kenosha. South of that system, the third and fourth options from the 1981 report became the basis for the BRT Alternative Options in this study.

The third option from 1981, exclusive busways, would achieve the same high-speed bus operations as freeways and parkways. However, it involves new busway construction in the corridor, and is therefore dependent on finding a satisfactory right of way for that new infrastructure. Using contemporary BRT terminology, this option is referred to herein, as the Exclusive Running Way Option.

The fourth 1981 option is the BRT Alternative - Reserved Lanes Option herein. While the first three 1981 options allow for high-speed operations, this final option typically results in a compromise in performance. Bus service benefits are still to be gained from the Reserved Lanes Option in comparison to the TSM, but they are more modest than under the Exclusive Running Way Option. These benefits derive from restrictions on crossing and turning traffic, timing of signals, and lane dividers to channelize traffic flow. The improvements can allow for an increase in bus performance in the reserved lanes over the existing local speed limits, but those increases typically will not reach the 55-65 mph ranges of the Exclusive Running Way Option.

In addition to running way improvements, the BRT Alternative may also incorporate the use of higher-capacity and thus more capital-intensive performance enhancements than does the TSM Alternative. These systems must be carefully designed to mitigate the possibility of elevated levels of conflict when crossing or mixing with existing traffic.³⁰

³⁰ LA getting crash course in new buses, Chicago Tribune, front page, December 27, 2005.



DEFINITION OF ALTERNATIVES

*Corridor Transit
Alternative Station
locations have
already been
submitted to public
review and
subsequently
endorsed.*

The BRT Alternatives may also incorporate the use of on-line passenger stations and compatible vehicle floor and platform heights that improve passenger accessibility while significantly reducing boarding, alighting and station dwell times.

A total of eleven (11) station locations were defined in the 2003 KRM study.³¹ The locations were subjected to public review and were endorsed by that study for both bus and rail alternatives. No objections or problems concerning those station locations have been identified since the earlier studies. As a result, those locations are carried forward into this study and are central to the definition of both the BRT and commuter rail alternatives. The stations are in Milwaukee (downtown), Cudahy/St. Francis, South Milwaukee, Caledonia, Racine-North, Racine, Racine-South, Somers, Kenosha, Winthrop Harbor, Zion, and Waukegan.

Specific to the area of new rail service between Kenosha and Milwaukee, five stations were originally defined in the 1998 KRM study as primary stations: Milwaukee, Cudahy/St. Francis, South Milwaukee, Racine and Kenosha. Three others were considered possible additional station locations: Oak Creek, Caledonia and Somers.³² Similarly, based on the 2003 ridership estimates,³³ the stations at Somers, Caledonia, Oak Creek and South Milwaukee are candidates for deferral to a full build out (FBO) system in the future. When comparing high-performance BRT to Commuter Rail, this more selective list of four primary and four possible additional stations is more appropriate.

BRT Alternative stops are proposed herein at the following primary locations:

³¹ *Op. Cit.* Regional Planning Commission, 2003, page 9.

³² *Op. cit.*, Regional Planning Commission 1998, page 65.

³³ WISE Ride: KRM Corridor Transit Study, Technical Report No. 3, "Ridership Forecasts for Alternatives," Regional Planning Commission, May 2002, pages 55 and 63.



DEFINITION OF ALTERNATIVES

Primary and future additional station locations have been identified.

Three stations serve as geographical anchors for any corridor transit alternative.

Kenosha has a Metra commuter rail station.

- Kenosha Metra Station
- Racine Transit Center
- Cudahy/St. Francis
- Milwaukee Amtrak Depot

Possible future additional station locations are:

- Somers
- Caledonia/4-Mile Road (with park-and-ride lot)
- Oak Creek/STH 100 (with park-and-ride lot)
- South Milwaukee

Three of the primary locations are existing transit center that function as geographical anchors for any new corridor transit system. As a result, all BRT routes would provide service that connects to the following locations:

Kenosha Metra Station

The southern terminal would be anchored by the northern terminal of Metra's UP North Line service. BRT riders traveling between Illinois and Wisconsin would transfer to or from existing Metra rail service. BRT service would be timed to make convenient connections with Metra at Kenosha. Since the current schedule of commuter trains at Kenosha is limited, it will be necessary to consider ways of either expanding the Metra service north from Waukegan or extending BRT service south to Waukegan, which currently has a higher level of rail service. The Kenosha Metra station location is served by many bus routes operated by the Kenosha Area Transit system, as well as the Kenosha Streetcar. In addition, the station is supported by parking. Its proximity to the many activities in downtown Kenosha makes this location a key collection/distribution point in the corridor.



DEFINITION OF ALTERNATIVES

Racine has recently built a new transit center adjacent to the old railroad station.

Racine Metro Transit Center

The Racine Metro Transit Center is composed of two key parts: The Belle Urban System off-street Transit Center and the adjacent railroad Passenger Depot. The Transit Center provides convenient covered access, with arrival and departure platforms, which are safely linked together by a covered bridge structure. Most routes are scheduled to meet and depart in common schedule windows at the center, which allows passengers to transfer between routes with minimal wait time. Once the Passenger Depot renovation is completed, it will connect with the Transit Center and serve as a waiting area for bus passengers. The Center is located west of downtown Racine on State Street.

Downtown Milwaukee

The center of commerce for Wisconsin and much of the upper Midwest, Downtown Milwaukee includes a large employment base. A BRT service should connect to the Amtrak Depot, which is located on the south edge of downtown convenient to the KRM corridor and/or continue through the Milwaukee central business district. As noted earlier, the City is planning a major reconstruction of the Depot to create a transit center for the downtown. The BRT would also connect to existing bus service in the downtown area to provide access to all parts of Milwaukee.

The only remaining transit center in Milwaukee is the Amtrak depot and the City plans a major reconstruction of it.

Because this is a bus alternative, at the north end of the alignment, in particular in downtown Milwaukee, there is a degree of built-in geographic collector/distributor capability and flexibility over time to adapt routing as the urban environment changes. These characteristics allow connecting some regularly scheduled or special event extra scheduled buses to diverse locations such as specific large employers, General Mitchell International Airport, downtown Milwaukee, Miller Park or universities.



DEFINITION OF ALTERNATIVES

The exclusive running way option has significant drawbacks.

Public bus systems serving as feeders and distributors are discussed in the TSM Alternative. They are also important to this and all alternatives in the study.

Fare structures will be comparable with and based on current fare policies.

The following discussions are preliminary definitions of BRT Alternatives. Refinements to these alternatives may be made as the project progresses. The final definition of surviving BRT Alternatives will be documented in the Capital and O&M Cost Estimate and/or Evaluation of Alternatives reports.

BRT - Exclusive Running Way Option

State trunk highways 31/32 and other major roads in the area are either distant from the cities in need of service or their alignments are not conducive to conversion to high-speed busways. Highway alignments in urban areas have existing speed limits dictated by tight curves in the road or by residential and commercial development in close proximity to the roadways. The speed limits cannot be increased to those of the Exclusive Running Way Option without significant property takes to widen the right of way. That widening would be very expensive, and would greatly affect the urban fabric of the corridor. Both of these facts are likely to engender opposition from area residents, business owners and other interested and affected parties.

Possible Exclusive Running Way ROWs were identified using the methodology outlined earlier. An office review of historical and current maps identified possible routes in the area. A site visit along those routes allowed the team to photograph the ROWs, to collect other publicly observable data relevant to the KRM study and to confirm the feasibility of the ROWs for BRT use. Following that process, the study identified the following BRT alignment from Milwaukee south:



DEFINITION OF ALTERNATIVES

However, it is possible to identify two potential alignments.

- I-794 south out of Milwaukee
- Lake Parkway (STH 794) south to Layton Avenue with traffic signal prioritization added for buses at Oklahoma Avenue.
- The wide ROW of Pennsylvania Avenue to Oakwood Road
- The abandoned Chicago North Shore and Milwaukee (CNS&M) (electric) Railway ROW to STH 31 in Racine (now used partly as a bicycle trail and partly as an equestrian trail)

Or, south of Layton:

- Adjacent to the UP tracks on the railroad ROW.

These links represent a classic use of available infrastructure and regional resources in determining a BRT alignment. The alignment south out of Milwaukee on I-794 and the Lake Parkway to Layton is an excellent example of using freeways and parkways which have higher speeds than the surrounding STHs and arterials.

South of Layton Avenue the only north-south state trunk highway is STH 32. An exclusive busway along STH 32 is not practical because of curves and development. However, two existing parallel rights of way were found that are not fully developed. They were considered plausible alignments for a new busway at least into Racine County.

The first alignment would run adjacent to the UP tracks on the railroad ROW. A jersey barrier would be required between the UP railroad and the busway facility. At-grade crossings would be equipped with sensors to lower crossing gates when a bus is approaching and raise crossing gates after the bus passes through the intersection.



DEFINITION OF ALTERNATIVES

Where exclusive running lanes are not possible, the BRT Exclusive Running Way Option service would revert to regular commuter bus operations.

The second alignment follows the relatively wide ROW of Pennsylvania Avenue to just north of Oakwood Road in Oak Creek, and then south-south-east along the abandoned CNS&M alignment well into Racine County.

South of Racine there are no higher-speed local roads, freeways/parkways nor open ROWs to support a BRT level of service other than the UP ROW discussed above. Therefore, if the BRT busway does not use the UP ROW, but instead follows the Pennsylvania/CNS&M ROW to Racine, between Racine and Kenosha there would be no exclusive running way. Instead, the BRT service would revert to commuter bus operations on existing highways providing service identical to that described in the TSM Alternative. But on those links of the system where BRT running ways can be created, the scheduled service would be faster and more reliable than under an equivalent TSM mode. This is an inherent advantage of the UP alignment for the BRT Alternative Exclusive Busway Option over the Pennsylvania/CNS&M alignment.

The resulting feasible alignments for the BRT Alternative are shown in **Figure IV-5**.

The Pennsylvania Avenue portion of these possible new busway alignments is indeed a relatively wide right of way of existing public land.

To the west of the northern portion of Pennsylvania is industrial development that, in turn, is adjacent to the UP New Line and General Mitchell International Airport (GMIA) further to the west. On the east side of Pennsylvania are industrial and residential areas. South of College Avenue, which is also the southern border of GMIA, both sides of Pennsylvania are bordered by residential uses. The grade of



DEFINITION OF ALTERNATIVES

The Pennsylvania Avenue corridor has promise for BRT but not for the exclusive running way option.

Pennsylvania Avenue in the area follows the slow rolling hills for much of its length. The combination of the residential areas and the rolling terrain are apparently responsible for the 25 to 45 mph speed limit along the road. Although the ROW width for a high-speed busway exists, some compromise on speed arising from busway alignment geometry following the terrain and/or the impact on local environment would likely be required to gain support for the design. Therefore, this ROW is not considered suitable for the BRT Exclusive Running Way Option. However, it is a viable candidate alignment for the subsequent Reserved Lanes Option.

The UP and CNS&M ROWs are privately held by a railroad, a conservancy and private parties. In correspondence, both the railroad and the conservancy strongly opposed any use whatever of their ROWs for a BRT busway.

The only other possible ROW for a high-performance exclusive busway would be to assemble a totally new alignment from portions of multiple private properties. This process would almost certainly require the use of eminent domain and would be an expensive and time-consuming activity, particularly in urban areas where multiple small properties contain single family houses and businesses. In these built-up urban areas, the need for BRT systems would be greater given slower operating speeds on local streets due to higher traffic volumes. However, as on the Pennsylvania alignment, putting a BRT on this ROW is likely to be opposed by local property owners and interest groups. Typical of this local opposition is a reply received from the conservancy owning the CNS&M ROW. They voiced opposition to any such new ROW similar and parallel to their trails, but at the same time they expressed support for the commuter rail concept.



DEFINITION OF ALTERNATIVES

Therefore, the BRT Alternative – Exclusive Running Way Option appears to be practical using buses on existing freeways and parkways for only 6 miles of the approximately 34-mile KRM corridor: from Milwaukee CBD south to Layton Avenue. South of Layton, the BRT would need to make compromises in speed by utilizing a lower performance option. Translated into the Alternatives and Options of this work, the Exclusive Running Way Option was screened out from further consideration in favor of the BRT Reserved Lanes Option.

BRT – Reserved Lanes Option

Following the methodology discussed above and two team site visits, the study team defined the following BRT Reserved Lanes Option.

The primary elements of the BRT Alternative - Reserved Lanes Options include:

- Two additional Metra reverse peak direction train trips in each peak period to and from Kenosha.
- New limited stop Bus Rapid Transit (BRT) service from the Kenosha Metra station to downtown Milwaukee. This service replaces existing Wisconsin Coach Lines intercity bus service.
- MCTS Route 48 (South Shore Flyer) service as in the No-Build (current service) Alternative.

The following facility improvements are proposed to support this expanded service:

- Exclusive bus lanes in select locations as a means to facilitate faster bus travel times.
- Park-and-ride lots at select BRT stops.
- Traffic signal prioritization. Signal improvements are assumed along the BRT alignment to reduce traffic signal delays.

The BRT reserved lanes option offers a better chance of implementation.

Some facility improvements are needed to support the reserved lanes option.



DEFINITION OF ALTERNATIVES

The BRT Alternative is anchored on the south by the Kenosha Amtrak station and the Kenosha Transit Center.

Following are detailed segment-by-segment descriptions of proposed infrastructure as it relates to the bus operations for the BRT Alternative – Reserved Lanes Option. **Figure IV-6** shows this Alternative Option graphically. This is a preliminary alignment as of March 2006. Refinements to this alignment are made as needed during the concept design of the system and are documented in general in the Evaluation of Alternatives Report and in more detail in the Capital and Operating & Maintenance Cost Estimate Report.

Kenosha Metra to Somers

Beginning at the Kenosha Metra station, the proposed alignment is 54th Street, 8th Avenue, 52nd Street and 7th Avenue to STH 32. The alignment then follows STH 32 to Highway E, where it deviates to a proposed Somers BRT stop and park-and-ride lot. BRT stops in this segment are as follows:

- Kenosha Metra. Buses use the existing loop road adjacent to the Metra train station.
- Kenosha Transit Center/park-and-ride lot. Buses stop on-street on 8th Avenue. A park-and-ride lot is proposed in the block located immediately west of 8th Avenue and north of 54th Street.
- Somers. A stop with a park-and-ride lot is proposed along Highway E, immediately west of STH 32.

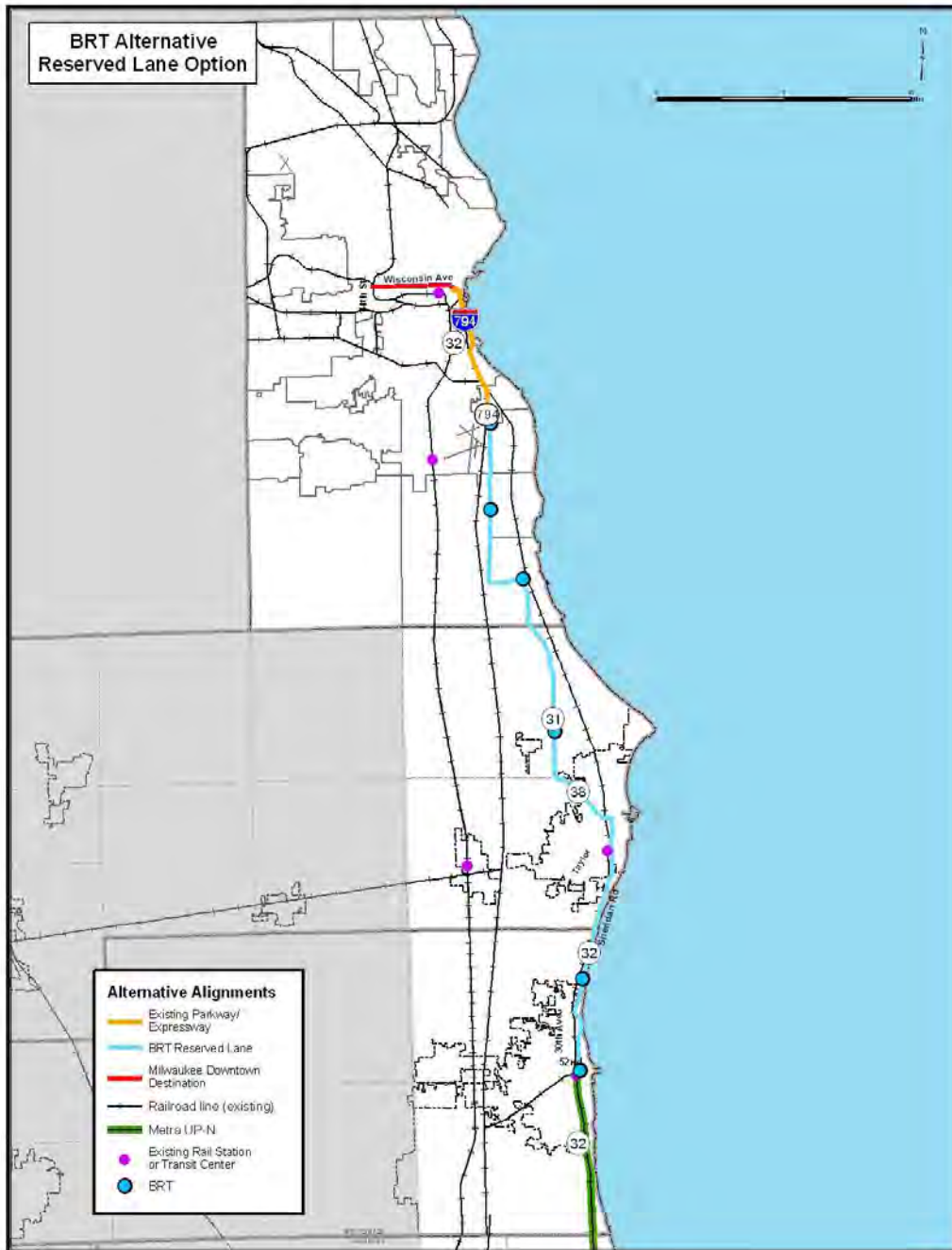
Proposed BRT treatments include the following:

- Two median BRT lanes are proposed along 7th Avenue, between 54th Street and 38th Street. These lanes would be distinguished by pavement treatments. Buses would operate at speeds of 5 to 10 mph faster than the posted speed limit for general traffic. One general traffic lane would be maintained in each direction.



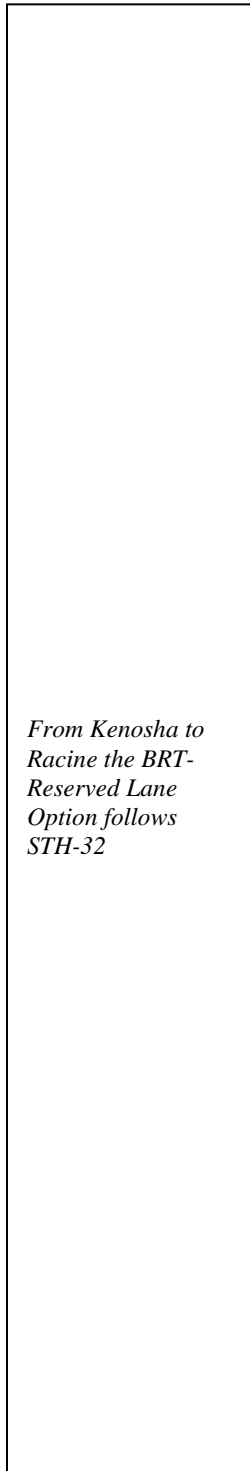
DEFINITION OF ALTERNATIVES

FIGURE IV-6. BRT ALTERNATIVE – RESERVED LANE OPTION





DEFINITION OF ALTERNATIVES



From Kenosha to Racine the BRT-Reserved Lane Option follows STH-32

- The BRT lanes would transition to the east side of 7th Avenue between 38th Street and Sheridan Avenue. The existing west (southbound) lanes would be converted to two-direction travel for general traffic.
- A single BRT lane would be constructed along STH 32, from 7th Avenue to Highway E. This lane would be separated from the general traffic lanes with lane dividers. Buses would operate at 60 mph in this bus lane. Access across this BRT bus lane would be limited to select locations. Southbound buses would use this lane in the morning hours and northbound buses would use this lane in the afternoon hours. This operations factor assumes that the primary commute direction is toward Chicago from Racine southward; north of Racine the primary commute direction is assumed to be toward Milwaukee.

Somers to Racine Transit Center

Beginning at the Somers stop, buses would return back to STH 32, and follow this highway into Racine. The proposed alignment in Racine is Racine Street, Washington Avenue, Marquette Street and State Street to the existing Racine bus transit center. Buses would operate non-stop between Somers and the Racine Transit Center. Proposed BRT treatments in this segment include:

- Beginning at Highway E, a single BRT lane would be constructed along STH 32, to Highway 11 in Racine. This lane would be separated from the general traffic lanes with jersey barriers. Buses would operate at 60 mph in this bus lane. Access across this BRT bus lane would be limited to select locations. Southbound buses would use this lane in the morning hours and northbound buses would use this lane in the afternoon hours.



DEFINITION OF ALTERNATIVES

From Racine to Oak Creek the BRT-Reserved Lane Option follows mostly the divided highway STH-31.

- BRT buses operate in mixed traffic in the City of Racine. Existing parking lanes, however, would be eliminated where feasible in the blocks immediately adjacent to signalized intersections. These parking lanes would be used as queue-jumper lanes for the BRT buses.
- Left turn lanes would be added at signalized intersections for parallel traffic crossing the BRT lane.

Racine Transit Center to Oak Creek

Beginning at the Racine Transit Center, buses follow STH 38 (Northwestern Avenue) to STH 31. They then follow STH 31 to STH 32, and continue north to Highway 11 in Oak Creek. Proposed BRT stops in this segment are::

- Racine Transit Center. Buses stop at a bay in the transit center, similar to current Wisconsin Coach Lines operations.
- STH 31/Four Mile Road. A stop and park-and-ride lot is proposed at this location.
- Oak Creek. A stop and park-and-ride lot is proposed at the Highway 100/STH 32 intersection. MCTS Route 48 would also operate from this park-and-ride lot.

Proposed BRT treatments include the following:

- Buses operate in general traffic lanes between the Racine Transit Center and the Four Mile Road stop/park-and-ride lot. It is proposed that consideration be given to increasing the posted speed limit along STH 31 from 30 and 35 mph to 50 mph.



DEFINITION OF ALTERNATIVES

From Oak Creek to Cudahy the BRT follows the 4 lane divided STH-100 and the wide Pennsylvania Avenue corridor

- North of Four Mile Road, a single BRT lane would be constructed to Highway 100. This lane would be separated from the general traffic lanes with jersey barriers. Buses would operate at 60 mph in this bus lane. Access across this BRT bus lane would be limited to select locations. Northbound buses would use this lane in the morning hours and southbound buses would use this lane in the afternoon hours. This is the reverse of proposed single BRT lane operations south of Racine.

Oak Creek to Layton/Pennsylvania

Beginning at Oak Creek, buses would follow Highway 100 and Pennsylvania Avenue to Layton Avenue. Proposed BRT stops in this segment include:

- Oak Creek park-and-ride lot
- Pennsylvania Avenue/Rawson Road. A stop is proposed at this location to connect with MCTS Route 15. No park-and-ride lot is proposed at this location.
- Pennsylvania Avenue/Layton Avenue (Cudahy): A stop is proposed at this location to connect with MCTS routes 15, 55 and 89 and a proposed new airport shuttle route. No park-and-ride lot is proposed at this location.

Proposed BRT treatments include the following:

- Buses operate in general traffic along Highway 100 to Pennsylvania Avenue.
- A single BRT lane would be constructed along Pennsylvania Avenue (in both the existing 2-lane and 4-lane sections). This lane would be separated from the general traffic lanes with lane dividers. Buses would operate at 40-45 mph in this bus lane. Access across this BRT bus lane would be limited to select locations. Northbound buses would use this lane in the morning hours and southbound buses would use this lane in the afternoon hours.



DEFINITION OF ALTERNATIVES

Layton/Pennsylvania to Downtown Milwaukee

Buses follow STH 794/I-794 into downtown Milwaukee. Buses exit at downtown Milwaukee, and follow Michigan Street, Van Buren Street and Wisconsin Avenue to Marquette University. No special BRT treatments are proposed in this segment of the alignment. Proposed stops in downtown Milwaukee (along Wisconsin Avenue) are as follows: Van Buren Street, Milwaukee Street, 4th Street, 6th Street, 10th Street and Marquette University.

5. Commuter Rail Alternative

The Commuter Rail Alternative will be developed and based in part on the Alternatives from the previous KRM studies, and will be similar to and coordinated with the existing Metra service to and from Kenosha. Under this Alternative, two basic types of commuter rail equipment will be evaluated. The first is conventional locomotive-hauled trains of bi-level gallery coaches. This type of equipment is currently in use throughout the Metra system. The second type involves the use of self-propelled coaches, also referred to as diesel multiple units (DMUs). DMUs have been used extensively in the past in the United States and have long been a staple of commuter rail service through much of the rest of the world. Recently, they have been proposed for new US commuter rail applications.

Locomotive-hauled trains and diesel multiple units will be compared.

Cross-platform transfers of riders to Metra will be evaluated as a means of matching seat capacity to ridership.

In addition, two operating concepts will be evaluated. The first starts with a cost-effective tailoring of train capacity specifically to KRM ridership by using DMUs that operate independently of, but timed to meet, Metra's UP-North trains. Commuters connecting between KRM and Metra services would make cross-platform transfers. In addition, new early AM and late PM trains to/from Chicago are added to fill in where none exist. The second concept assumes through service trains operating between



DEFINITION OF ALTERNATIVES

The UP Kenosha subdivision is the only Rail Alignment feasible in the KRM corridor.

Public review showed strong support for a Rail Alternative for the KRM corridor.

Milwaukee and Chicago. Cross-platform transfers are eliminated and train consists (type and number of locomotives and cars in a train) are assigned to runs based on the needs of the entire corridor.

The only rail alignment in the KRM corridor that is feasible for all rail alternatives considered in this study is the UP Kenosha Subdivision which passes through the centers of many of the lakeshore cities in the KRM corridor. The reasons for this choice are:

- The line is the closest rail alignment to the population and job centers in the corridor.
- It provides an immediate connection to the existing Metra UP-North commuter rail service.
- It passes immediately adjacent to the new Racine Transit Center, the central focus of all of Racine's BUS routes. The Transit Center has provisions to connect with the old railroad station and the station is being rehabilitated.
- It has easy access to connect to the Milwaukee Amtrak Depot at the north end of the study area.
- As noted earlier, the four primary and four possible additional station locations and the rail alignment have already been subjected to intensive public review during the 2003 KRM study and have been solidly endorsed by that work. The comments of interested and affected parties strongly favored a rail alternative for the corridor, focusing on the environmental, traffic and economic development benefits of rail transit.

Station locations are defined to be comparable with those of the BRT Alternative and will initially be based on the primary and possible future station locations discussed earlier. An additional City of Milwaukee station has been added at Lincoln Avenue and is called "South Side



DEFINITION OF ALTERNATIVES

The recommended route and station locations for commuter rail are well established by history and current public acceptance.

Milwaukee”³⁴. Requirements related to layover facilities, yards and shops and related track, signal, civil and structural improvements are described generally in this document and will be refined during later stages of this study.

The recommended route to be used includes the UP Kenosha Subdivision between the Kenosha Station to the connection with the CP in Milwaukee, a distance of 31.4 miles. The route’s northern terminus is the Milwaukee Amtrak Station on the CP, which is 1.2 miles from the UP/CP connection. The route’s length from the Milwaukee Amtrak Depot to the current intermodal station in Racine is 22.3 miles; to the existing Metra station at Kenosha it is 32.6 miles; to Metra’s Waukegan station it is 48.3 miles, and to the Ogilvie Transportation Center in downtown Chicago it is 84.2 miles.

The resulting station locations and alignment for the Commuter Rail Alternative are shown in **Figure IV-7**, and are identical to the full length commuter rail alternative defined in the 2003 KRM study. Cross-platform transfers between KRM and Metra would occur at Kenosha at a minimum, when scheduling permits. Greater schedule opportunities exist with the extension of KRM operations to Waukegan in operating windows that are available from Metra. This would create an additional site for cross-platform transfers in Waukegan. Selective additional KRM trains traveling the full length between Milwaukee and Chicago are also possible in windows which do not conflict with Metra’s current operations.

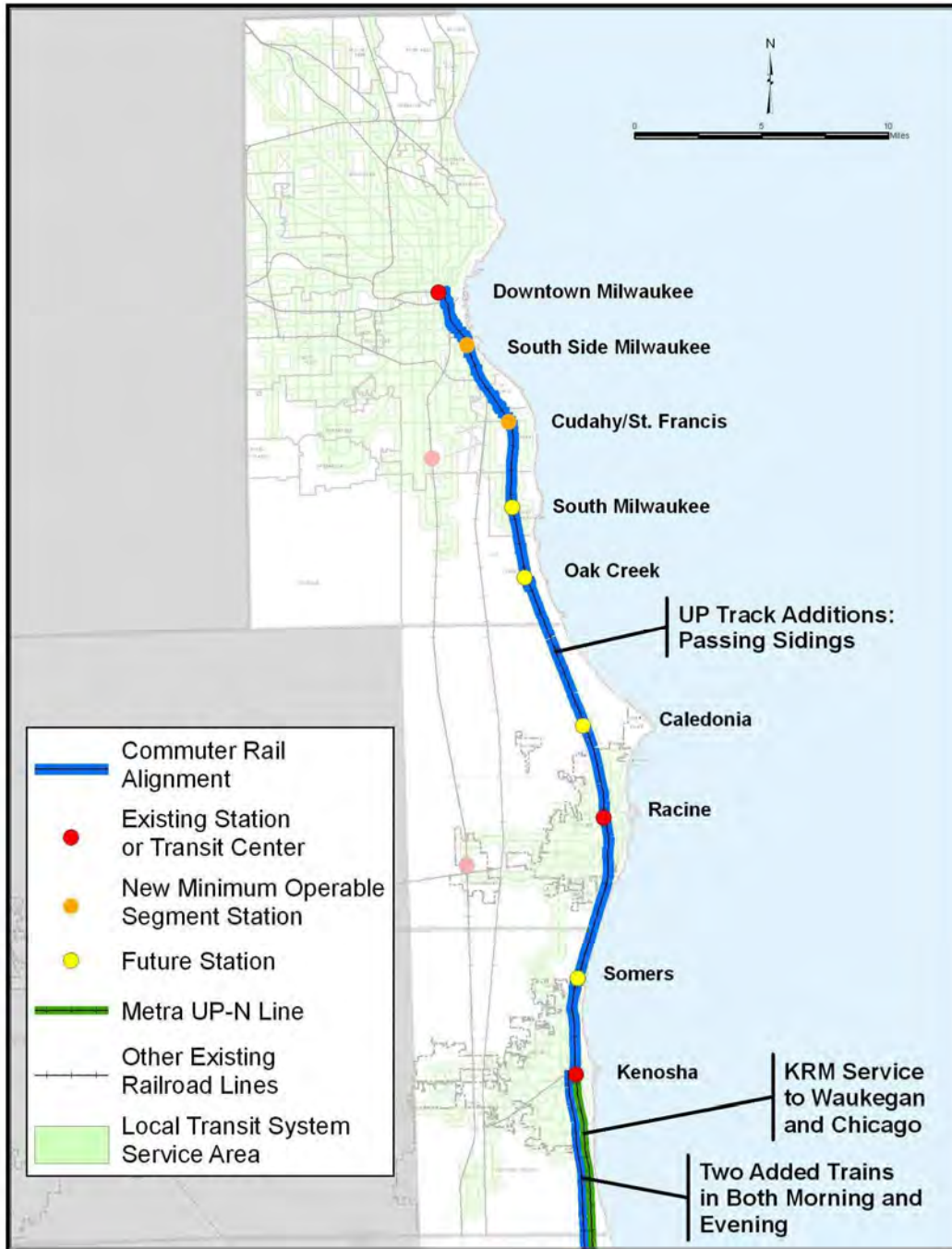
General requirements related to stations, layover facilities, yards and shops and related track, signal, civil and structural improvements from the 2003 KRM study are generally sufficient for these commuter rail options. The current employee operating timetable shows a 40-mph speed limit for

³⁴ “KRM South Side Station,” e-mail Jeffrey J. Mantesto Otto P. Dobnick, June 22, 2006.



DEFINITION OF ALTERNATIVES

FIGURE IV-7. ALIGNMENT FOR RAIL ALTERNATIVES





DEFINITION OF ALTERNATIVES

New maintenance facilities would need to be tailored for DMU operations.

Restoring trackwork to create passing sidings would also need to be tailored to optimize operations

freight trains on the track. That corresponds to Federal Railroad Administration Class 3 track, which allows 60-mph passenger operations.

UP track charts show curvatures of 1° or less, which would support the 60-mph operation. Two rail refinements are expected in the capital and O&M costing work of the project, but they would not have any significant impact on the basic definition of alternatives here.

1. Perhaps the most significant change from the 2003 work is the need for tailoring layover facilities and yards and shops to the rolling stock that is used (locomotive-hauled coach trains versus diesel multiple units). The Regional Planning Commission 2003 KRM study assumed locomotive-hauled coach trains operated by Metra. As a result rail maintenance was assumed to be performed at Metra's current combination of California (coaches) and M-19A (locomotives) facilities, supplemented by Metra's other heavy repairs at its Rock Island District (RID) 47th Street facility. With DMUs, separate agency and new maintenance facilities may be required. These facilities will be refined during later stages of this study.
2. Another possible change from the 2003 study is the location of passing sidings, restored from the original double track alignment of the C&NW. Generally speaking, whenever possible, stations should be located on sections of double track so that a commuter train can stop for passengers while passing trains are making progress on the other track. This concept is sometimes extended to "super sidings" which extend over several stations, starting just before one and just after the last of the group. The tailoring of sidings to optimize passing operations will be reviewed during the costing effort of the project and may change the location of those sidings, but is unlikely to change their quantity significantly.



DEFINITION OF ALTERNATIVES

DMU fare collection procedures would differ from Metra's.

KRM fare structure would draw heavily from Metra's.

An important part of the definition of the commuter rail alternative serving the KRM corridor is the preservation of access to and from Metra's Waukegan and Kenosha Yards (passenger trains), UP's Waukegan Yard (freight trains), and UP's freight customers along the line. Reliable service into Milwaukee's Amtrak Depot will also depend on transferring Canadian Pacific Railway freight traffic from the Depot line to an alternate parallel route through the CP's Muskego Yard.

Public bus systems serving as feeders and distributors are discussed in the TSM Alternative. They are also important to the success of this and all Alternatives of the study.

Because of double-deck diesel multiple unit cars chosen in the preliminary operating plans later in this report, and the use of only one conductor with the passengers on-board the vehicles, a proof of payment fare collection system will need to be used. This differs from Metra's on-board conductor-collection system.

A preliminary structure for the KRM fares will be based largely on the Metra's five-mile zone fare structure.³⁵ Stations are assigned to 5-mile zones (zones A through M) which are based on track distance from each line's Chicago terminal. The KRM system would correspond to zones K to Q. A base fare is charged for travel within a zone, and increments are added as zone boundaries are crossed. Metra's single ride rates for the first two zones (e.g., AA and AB... DD and DC, etc.) are set lower due to a special short-trip fare program implemented in 1985. This Program set rail fares at a level comparable to the parallel CTA rapid transit fare, but that refinement will not be needed in the KRM system. As a result, while Metra's single ride base fare is \$1.95, the KRM fares would start at \$2.25,

³⁵ "2006 Metra Program and Budget," Fare Structure, page 51.



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then rise \$0.40 or \$0.45 for each additional zone and would equal Metra fares for trips of three zones or more.

In addition to one-way tickets, Metra offers ten-ride tickets and monthly passes, which are discounted based on multiples of the applicable one-way fare (i.e. ten-ride = 8.5x; monthly = 27x). Metra also sells tickets at reduced rates for senior citizens, customers with disabilities, students and children. Metra does not currently have a transfer system with the three other transit authorities in the Chicago area (i.e., CTA, Pace and NICTD), so separate fares will likely be paid to the KRM and Metra systems. If the KRM fare policy replicates the Metra policy as described above, this dual payment of fares will result in automatic transfer fees arising from double base fares (one to KRM and one to Metra) plus a repeating of the zone charge where the transfer occurs. The alternative would be to assess the base only once for transfer trips. This would require a revenue sharing arrangement with Metra (particularly for monthly passes) and require Metra conductors to issue a transfer ticket to riders using single ride and ten-ride tickets.

The following discussions are preliminary definitions of Commuter Rail Alternatives. Refinements to these alternatives may be made as the project progresses. The final definition of surviving Commuter Rail Alternatives will be documented in the Capital and O&M Cost Estimate and/or Evaluation of Alternatives reports.

Commuter Rail – Independent Option

One of the major institutional issues facing the KRM Commuter Rail Alternative is that the KRM service is outside Metra's legislated six-county Illinois operating region. While this is not a fatal flaw, it is useful to examine a commuter rail option which works around the issue. This option is designed for service that is optimized over the KRM corridor,

Cross-platform transfers would make connecting service between two lines very convenient.



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operating separately from Metra's service, and reaching into Metra's region when non-conflicting windows exist in Metra's service. Connecting service between the two lines could be made very conveniently, or relatively seamlessly, through cross-platform transfers. In the transfer passengers would wait in their seats on one train until the other train arrived, and then walk from one seat to the other across a station platform. The transfers would be located at the ends of train routes so that the trains could be scheduled to wait until they would meet and passengers would not be required to stand on the platform.

Metra has expressed a willingness³⁶ to allow such operations on the UP-North line as long as public schedule operating windows are available, the operations do not interfere with all Metra operations (i.e. including deadhead and station platform movements) and the UP agrees. This willingness includes early morning and late afternoon KRM runs all the way to Chicago. The UP has been asked³⁷ if they would agree to this KRM service and if they would be willing to operate it. As of September 8, 2006 the UP has not declined.

Commuter Rail – Through Service Option

A second institutional issue facing the Commuter Rail Alternative is the relative inflexibility of adapting the seating capacity of locomotive-hauled coach trains to the varying cumulative ridership demand along a commuter rail line.

The use of diesel multiple units (DMUs) in the Independent Option along with cross-platform transfers offers a way to address that issue. In the Through Service option the need for cross-platform transfers between

The through service option would provide direct one-seat ride service to Chicago.

³⁶ "Metra KRM Meeting, January 11, 2006." E-mail Grigg to Dobnick, Yunker (cc: Ciavaralla and Tidwell, Metra).

³⁷ Minutes of Meeting, "Railroad Coordination," Payette (UP) and Gary (ET), June 23, 2006.



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Diesel multiple units would offer flexibility in the planning of the KRM corridor service.

KRM and Metra trains is eliminated. The result would be truly seamless one-seat ride between Illinois and Wisconsin stations.

A fleet of DMUs also offers an institutional flexibility in the planning of the KRM corridor that is usable in this option. Metra has expressed interest in using DMUs on several of its new lines³⁸ but has yet to make any commitments to purchase such equipment, and, as noted above, they have been reluctant to operate new service outside their Illinois 6-county area. However, as distinct, self-contained rolling stock, DMUs offer the institutional flexibility of allowing either Metra or a new KRM-oriented transit agency to operate and maintain them whether as the Commuter Rail Alternative Independent Option with cross-platform transfers above, or under an immediate or future joint operating agreement that makes optimal use of both DMU and locomotive-hauled trains along the entire corridor. Some form of joint agreement is the basis of this Through Service Option for this study. The optimal operation may offer advantages not just to KRM, but also to Metra.

The specific form of this direct one-seat ride DMU service for KRM depends on what can be negotiated among the KRM agency, Metra, and the UP.

General requirements related to stations, layover facilities, yards and shops and related track, signal, civil and structural improvements are discussed in the Commuter Rail Alternative – Independent Option. The comments there are equally valid for this option.

Public bus systems serving as feeders and distributors are discussed in the TSM Alternative. They are also important to the success of this and all alternatives and options in this study.

³⁸ Metra Proposed TEA-21 Reauthorization Initiatives, Creating New Service Opportunities Now and For the Future, Updated March 2003, page 19.



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Metra will not support the through service option.

Metra has indicated that they will not participate in any operations north of Kenosha³⁹. Therefore, this alternative is removed from further evaluation. It is retained in this report only as a placeholder to ensure that this decision is reviewed again with Metra for possible reconsideration before beginning Final Design.

Commuter Rail – Through Service Locomotive-Hauled Option

The final commuter rail alternative to consider is the simplest concept. Metra locomotive-hauled coach trains which start in Chicago would run all the way to Milwaukee making normal passenger station stops, but not stopping to change the length of the train by uncoupling or coupling cars. As with the Through Service Option above, which uses a combined fleet of DMUs and locomotive-hauled trains, this alternative eliminates the need for transfers from Metra to separate KRM trains so it offers direct one-seat rides between Illinois and Wisconsin stations.

General requirements related to stations, layover facilities, yards and shops and related track, signal, civil and structural improvements are discussed in the Independent Option. The comments there are equally valid for this Option.

This is the basic rail alternative that was proposed in the 2003 KRM study. However, the FTA expressed concern⁴⁰ that when Metra service extends past Kenosha, the seat capacity of the trains is determined by the maximum demand of Chicago's North Shore before the trains reach Kenosha, not by the KRM service. The capital cost of purchasing extra cars might be justified for the project. However, the added vehicle-miles

³⁹ *Op. cit.*, Grigg, January 11, 2006 e-mail.

⁴⁰ *Op. cit.*, FTA Letter, May 18, 2004.



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In 2003 FTA expressed concerns about operational cost-effectiveness in the Through Service Locomotive-Hauled Option.

Two other alternatives in this study already address that cost-effectiveness.

The three transit modes being considered for further study – commuter bus, BRT, and commuter rail – have different service properties.

and associated operating and maintenance expense caused by hauling empty seats over the full KRM route would be attributable to the KRM project and would degrade the cost effectiveness of the line. See “Bus/Rail Alternative” in Section 6 below for a detailed discussion of this issue.

Both the Independent and Through Service Options of the commuter rail alternative address this cost effectiveness issue. Those options offer significantly more flexibility in operational and institutional issues and have the benefit of apparent better cost effectiveness. In view of those other commuter rail alternative options, there is no compelling advantage to keeping the Through Service Locomotive-Hauled Coach Option for further study. It will not be carried forward to the Capital and Operations Maintenance Cost Estimate work of this project.

6. Other Alternatives

Baseline Alternative

As indicated earlier, a Baseline Alternative is needed as a comparison standard for the Build Alternatives. The Baseline will be derived from some combination or extension of No-Build and Transportation System Management (TSM) Alternatives. That Baseline definition will be agreed upon with the FTA before these comparisons begin. The FTA’s New Starts documentation indicates that “in most cases, the New Starts Baseline Alternative will be the TSM Alternative.”⁴¹

The No-Build and TSM Alternatives are based on the existing commuter bus transit mode, which has service properties that are significantly different from the two Build Alternative modes, BRT and commuter rail. As

⁴¹ *Op. cit.*, FTA, Part I Planning and Project Development Guidelines, Appendix A, page 1.



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a result, three distinct transit modes, with inherently different service properties, are studied herein: commuter bus (Baseline), BRT and commuter rail.

Rail and Bus Alternative

A variant on the basic BRT and Commuter Rail Alternatives is the combined use of an extension of the existing commuter rail service from Kenosha to Racine with BRT service between Racine and Milwaukee.

The 2003 KRM study included two service levels of a “Combination Rail and Bus Alternative.” However, the bus portion of the service was an upgrade of conventional bus, not BRT. So in the FTA’s current language, it corresponded to TSM service. As previously noted, the FTA’s guidelines now indicate that the TSM normally becomes the baseline. As a result, that 2003 Rail and Bus Alternative transposed into the current study would be a commuter rail extension superimposed on the baseline, or simply a partial Rail Alternative.

Updating the 2003 combination alternative concepts to the current FTA New Starts environment, methodology and service level, a commuter rail extension to Racine could be teamed with BRT, instead of TSM, from Racine to Milwaukee to provide comprehensive commuter service in the KRM corridor. As noted earlier, the rail side of this alternative would be an extension of the existing Metra service to Kenosha which uses conventional locomotive-hauled trains of gallery cars. No alternative passenger rolling stock, such as diesel multiple units (DMU), could be considered because the extension would be so short and the addition of different equipment would introduce a second transfer into trips between points south of Racine and Milwaukee.

The 2003 study combination of bus and rail commuter service is considered.



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Metra will not support the Rail and Bus Alternatives.

As discussed in the BRT Alternative, the bus operations of this BRT/Rail Alternative offers a degree of built-in collector/distributor capability and flexible routing at the north end of the alignment, in downtown Milwaukee.

The implementation of this alternative is dependent upon the willingness of Metra to provide the expanded service. In the past, Metra has not been willing to provide service outside its Illinois-legislated six-county service area. The sole exception to date has been the service to Kenosha which Metra inherited as a preexisting condition when it was created in the mid 1980's. Metra has indicated that they will not participate in any operations north of Kenosha⁴².

A second issue with the BRT/Rail Alternative is that it does not address a key problem of cost effectiveness raised by the FTA relative to the Regional Planning Commission 2003 KRM study.⁴³ The FTA's concern was that when Metra service extends past Kenosha, the seat capacity of the trains is determined by the maximum demand of Chicago's North Shore before the trains reach Kenosha, not the demand for KRM service. The capital cost of purchasing extra cars might be justified for the project. However, the added vehicle-miles and associated operating and maintenance expense caused by hauling empty seats over the KRM route degrades the cost effectiveness of the line.

This surplus capacity problem is inherent in all of Metra's commuter lines which radiate out from the heart of the Chicago metropolitan area, the Loop. As afternoon riders get off, seats are left empty. The problem is difficult to address with locomotive-hauled trains. To uncouple and set-aside surplus cars mid-way through a run requires either the capital cost and crew for a switch engine waiting at the cut-out point, or additional lost

⁴² *Op. cit*, Grigg, January 11, 2006 e-mail.

⁴³ Letter, Ettinger (FTA) to Evenson (Regional Planning Commission), Kenosha-Racine-Milwaukee Corridor Study, Operating Cost and Revenue Findings, May 18, 2004.



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The coupling / uncoupling of commuter trains online raises several issues.

trip time by the commuter train itself to switch out the cars. With Metra's current equipment, both the coupling and uncoupling of cars requires a crew member on the ground not only for the mechanical coupler, but also for the electrical disconnecting and jumpering of train line cables. (Train lines carry control signals, communications and power to all cars of the train between the locomotive at one end and the cab car at the other. When cars are uncoupled, the cable from car A must be unplugged from car B and jumpered back into car A from whence it came before the train is able to move.)

Furthermore, even if the coaches were equipped with automatic coupling/uncoupling and concurrent automatic train line connection/jumpering to save time, as on many heavy rail transit systems such as the Chicago Transit Authority (CTA), the whole process would be fraught with reliability issues. There is at least one US example of commuter rail trains using coupling/uncoupling in daily service. The Northern Indiana Commuter Transit District (NICTD) performs the operation on a daily basis for a few of its commuter trains which come in from distant stops, such as South Bend, Indiana. However, that is an electrified railroad which uses electric multiple unit (EMU) cars. As such, NICTD operates more like CTA, a heavy rail transit agency, than like Metra, a locomotive-hauled commuter train transit agency.

For these reasons, traditional locomotive-hauled commuter rail operations in the US typically do not tailor train size to demand through on-line coupling/uncoupling. Furthermore, for Metra it would entail modifications to their current locomotive-hauled equipment which requires manual coupling/uncoupling. The process might be simplified if Metra were to operate its trains to Kenosha with new diesel multiple units (DMU) with automatic couplers. Some of the DMUs could uncouple from the train to complete the KRM service. That would address the cost effectiveness issue. However, Metra has clearly expressed no intention of modifying its

On-Line coupling / uncoupling will not be studied in this project.



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The Bus-rail Alternative from the 2003 study is less cost-effective than other alternatives studied herein

The FTA suggests consideration of a minimum operable segment

operation to include on-line coupling/uncoupling for either the current locomotive-hauled trains or the possible future use of DMUs.⁴⁴ Therefore, on-line coupling/uncoupling is not carried further in this study.

As such, because of the existing operating philosophy of Metra, tailoring train size to demand cannot be addressed through use of Metra locomotive-hauled trains or DMUs.

For these reasons, the Rail and Bus Alternative will not be carried forward for more detailed analysis.

Minimum Operable Segment (MOS)

The Federal Transit Administration (FTA) New Starts program states:

“If the project sponsor intends to build the New Starts project in phases, starting with a minimum operable segment (MOS), then it is the MOS that should be evaluated using the New Starts criteria.”⁴⁵

The spirit of the MOS means that the success of the KRM New Starts funding application can be enhanced if a smaller or more limited initial phase can be found, a MOS, that has higher evaluation results. While full detailed analyses of multiple Build Alternatives are not practical in this study, this search for higher evaluation results can be approximated as a trade off or optimization between amortized capital and operating costs, and ridership. How would the benefits lost through ridership disincentives arising from less convenient service compare to the cost savings?

In this phase of the KRM program, an initial analysis and conceptual design resulted in the definition of the full build out (FBO) systems described herein. Following the development of the ridership model, a

⁴⁴ *Op. cit.*, Grigg, January 11, 2006 e-mail.

⁴⁵ “Reporting Instructions for the Section 5309 New Starts Criteria,” FTA, May 2006, page 13.



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series of ridership parametric modeling runs will be made to test the sensitivity of major parameters of the surviving alternatives on the ridership results. Those parametric runs will be used to search for simplifications to the FBO that produce more favorable results. The most favorable of the simplifications will be documented and evaluated in the Capital and O&M Cost Estimate Report and the Evaluation of Alternatives Report of this project.

In general, there are three areas where the FBO system might be simplified to assist in the creation of a more cost effective system; whether it is called an MOS or not:

1. Shorten the service length: On traditional radial transit systems reaching out from a central business district (CBD), the most common method for creating a MOS from the FBO is the shortening of the line to lower the costs of infrastructure. However, the KRM corridor is located between two strong CBDs rather than simply radiating from one and the Chicago CBD is already served with excellent commuter rail service to the southern end of the KRM corridor. Ridership estimates in the previous study⁴⁶ show that 37% to 39% of all KRM riders cross the Wisconsin-Illinois state line in making their trips, so there is no conventional end-of-line that can be easily shortened.
2. Use fewer stations: Because of rail station costs, this is a viable option for Commuter Rail. It was originally considered in the 1998 KRM feasibility report by defining primary as well as possible additional stations. Opening with fewer stations is also discussed earlier in this report under the BRT Alternative. For BRT the station costs are considerably lower and represent a relatively small possible saving. However, for the TSM Alternative defined herein, there is no practical option. The only significant station costs in the TSM are the two new parking and transit centers which are located at major

Conventional MOS scenarios shorten the alignment, but it doesn't apply here.

Alternate MOS – like rationalizations involve optimizing the number of stations and length of the peak period.

⁴⁶ *Op. cit.* WISE Ride, Tech Report No. 3.



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transfer points for bus lines. Removing them would destroy the functionality of the alternative.

3. Operate a smaller vehicle fleet: Fleet reductions with the same line haul capacity can be accomplished by recycling vehicles in the peak period. However, to achieve these turn-around operations either the peak period must be assumed to stretch out over a longer service period or some trains would need to make short-turns rather than run the full length of the line. These are issues which lengthen the average service headways in the peak and are likely to reduce ridership. They can be tested in the ridership parametric modeling.

V. PRELIMINARY OPERATIONS PLANS

Preliminary operations plans have been developed for the TSM, BRT and commuter rail alternatives as input to the environmental analysis, land use and development, ridership forecasting and cost estimating activities. These plans are preliminary and will be refined as the project alternatives are better defined. The final operating plans for those Alternatives that survive the second screening, including those for a minimum operable segment (MOS), will be documented in the Capital and O&M Cost Estimate and/or Evaluation of Alternatives reports. In general, the plans assume substantial service improvements north of Kenosha, with connecting service south into Illinois and early morning/afternoon one-seat rail links with Chicago.

*Preliminary
operating plans are
provided here.
Final plans will be
in the cost report.*



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Preliminary operations plans for the TSM Alternative are summarized.

1. Transportation System Management (TSM) Alternative

The Transportation Systems Management (TSM) Alternative has been designed to provide a comparable level of service to the proposed Bus Rapid Transit (BRT) and commuter rail alternatives, but at a significant reduction in cost. The primary service improvements included in the TSM Alternative are expanded Metra commuter rail service to Kenosha, expanded Wisconsin Coach Lines service, and expanded MCTS Route 48 service.

Metra Service

There are presently 62 weekday one-way trips on the Metra UP-North line to and from the Ogilvie Transportation Center (OTC) in downtown Chicago. Eighteen (18) of these trips provide service to or from Kenosha, 32 begin/end at Waukegan, 7 begin/end at Highland Park or Ravinia Park, and 5 begin/end at Winnetka. Current scheduled Metra service at Kenosha is shown below in **Table V-1**.

TABLE V-1. EXISTING METRA WEEKDAY TRAIN SCHEDULE

SB Departures From Kenosha	NB Arrivals To Kenosha
5:55 AM	8:15 AM
6:17 AM	2:15 PM
6:53 AM	5:39 PM
7:15 AM	6:30 PM
7:51 AM	6:40 PM
8:49 AM	7:10 PM
2:49 PM	7:51 PM
5:51 PM	11:15 PM
11:35 PM	2:15 AM



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Proposed additional northbound and southbound train trips are described.

Ten Metra stops between Chicago and Kenosha are proposed for ("limited service") the TSM Alternative.

As shown above, there is reasonably good peak period, peak direction service to and from Chicago. However, there is minimal service in what Metra considers the "reverse peak direction" (northbound to Kenosha in the morning and southbound from Kenosha in the afternoon). There is currently only one morning and one afternoon trip of this type. The TSM Alternative assumes an additional northbound Metra train trip that departs Chicago at 6:07 AM and runs in limited service (making stops at only 6 of the 28 stations between Chicago and Kenosha), arriving at Kenosha at 7:35 AM. This additional train trip would meet with expanded Wisconsin Coach Lines bus service, as described in the following section. Similarly, an additional southbound Metra train trip is proposed in the afternoon peak period. This trip would depart Kenosha at 5:17 PM and arrive in downtown Chicago at 6:40 PM.

There are 25 stations on the Metra-UP North line, not including OTC and Kenosha. The following is a preliminary list of ten Metra stops between Chicago and Kenosha for the proposed added limited service:

- Chicago (OTC)
- Ravenswood
- Davis Street (Evanston)
- Wilmette
- Braeside
- Highland Park
- Lake Forest
- Great Lakes
- Waukegan
- Zion
- Winthrop Harbor
- Kenosha



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Wisconsin Coach Lines Service

Wisconsin Coach Lines presently operates 16 weekday one-way trips and eight weekend/holiday one-way trips. The full route length is approximately 46 miles and has a scheduled travel time of 90 minutes (from Global Travel in Kenosha to Milwaukee). The existing Wisconsin Coach Lines bus schedule is shown below in **Table V-2**.

**TABLE V-2. WISCONSIN COACH LINES
 EXISTING WEEKDAY BUS SCHEDULE**

Dir.	Global Travel	Kenosha Metra	Racine Tr. Ctr.	Mitchell Airport	MKE Greyhound
NB	5:15 AM	5:21 AM	5:48 AM	6:25 AM	6:44 AM
	6:15 AM	6:21 AM	6:48 AM	7:25 AM	7:44 AM
	6:50 AM	6:56 AM	7:23 AM	8:00 AM	8:19 AM
	8:45 AM	8:51 AM	9:18 AM	9:55 AM	10:14 AM
	12:15 PM	12:21 PM	12:48 PM	1:25 PM	1:44 PM
	2:30 PM	2:36 PM	3:03 PM	3:40 PM	3:59 PM
	3:35 PM	3:41 PM	4:08 PM	4:45 PM	5:04 PM
	7:05 PM	7:11 PM	7:38 PM	8:15 PM	8:34 PM

Dir.	MKE Greyhound	Mitchell Airport	Racine Tr.Ctr.	Kenosha Metra	Global Travel
SB	5:15 AM	5:35 AM	6:13 AM	6:39 AM	6:45 AM
	7:00 AM	7:20 AM	7:58 AM	8:24 AM	8:30 AM
	8:50 AM	9:10 AM	9:48 AM	10:14 AM	10:20 AM
	12:00 PM	12:20 PM	12:58 PM	1:24 PM	1:30 PM
	2:00 PM	2:20 PM	2:58 PM	3:24 PM	3:30 PM
	4:25 PM	4:45 PM	5:23 PM	5:49 PM	5:55 PM
	5:15 PM	5:35 PM	6:13 PM	6:39 PM	6:45 PM
	9:00 PM	9:20 PM	9:58 PM	10:24 PM	10:30 PM

Wisconsin Coach Lines schedule changes are proposed to provide better timed meets with Metra train service.

The TSM Alternative assumes expansion of the Wisconsin Coach Lines service, with no changes proposed to alignments. However, current scheduled times are modified to provide better timed meets with Metra train service at Kenosha. Additional bus trips are added to provide enhanced intercity bus capacity in the KRM corridor and to provide



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New commuter bus stops for the Wisconsin Coach Lines TSM operation are identified.

additional timed meets with Metra train service. The proposed additional bus service would not serve Global Travel. Overall, the TSM Alternative reflects expansion of Wisconsin Coach Lines service from its existing 16 one-way trips to 34 one-way trips (17 in each direction). Thus, intercity bus service is approximately doubled in the TSM Alternative.

The following is a preliminary list of TSM commuter bus stops for the WCL service:

Kenosha:

- Global Travel
- Kenosha Transit Center
- Kenosha Metra Station
- Sheridan & Washington Road
- Carthage College

Somers

- STH 32 & 12th Street

Racine

- STH 32 & Durand Avenue
- 14th & Racine
- Racine Transit Center
- Douglas & Gould
- Douglas & 3-Mile Road

Caledonia

- Douglas & 4-Mile Road

Oak Creek

- STH 32 & STH 100
- Ryan & Howell

Milwaukee:

- Mitchell International Airport
- Michigan & Cass
- Michigan & Plankinton
- Michigan & 5th



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- Greyhound Depot

Table V-3 presents a proposed schedule for Wisconsin Coach Lines. This table identifies Metra train arrivals and departures in Kenosha and identifies the bus trips that would have timed meets with Metra train trips. There are timed meets with 12 Metra train trips. This bus schedule assumes 10 percent additional travel time for each bus trip to account for travel time degradation in this project's future year network.

TABLE V-3. TSM WISCONSIN COACH LINES
 PROPOSED WEEKDAY SERVICE SCHEDULE

A preliminary WCL
 TSM schedule is
 defined.

Dir.	Global Travel	Metra Trains	Kenosha Metra	Racine Tr. Ctr.	Mitchell Airport	MKE Greyhound
NB	5:15 AM		5:21 AM	5:51 AM	6:32 AM	6:52 AM
			5:51 AM	6:20 AM	7:01 AM	7:22 AM
	6:15 AM		6:21 AM	6:51 AM	7:32 AM	7:52 AM
	6:50 AM	<u>6:48 AM</u>	6:56 AM	7:26 AM	8:07 AM	8:27 AM
			7:20 AM	7:49 AM	8:30 AM	8:51 AM
			7:41 AM	8:10 AM	8:51 AM	9:12 AM
			7:56 AM	8:25 AM	9:06 AM	9:27 AM
	8:15 AM	8:15 AM	8:21 AM	8:51 AM	9:32 AM	9:52 AM
			10:51 AM	11:20 AM	12:01 PM	12:22 PM
	12:15 PM		12:21 PM	12:51 PM	1:32 PM	1:52 PM
	2:30 PM	2:15 PM	2:36 PM	3:06 PM	3:47 PM	4:07 PM
	3:35 PM		3:41 PM	4:11 PM	4:52 PM	5:12 PM
			4:16 PM	4:45 PM	5:26 PM	5:47 PM
			4:51 PM	5:20 PM	6:01 PM	6:22 PM
			5:39 PM	5:45 PM	6:14 PM	6:55 PM
		6:40 PM	6:45 PM	7:14 PM	7:55 PM	8:16 PM
7:05 PM	7:10 PM	7:11 PM	7:41 PM	8:22 PM	8:42 PM	

Dir.	MKE Greyhound	Mitchell Airport	Racine Tr.Ctr.	Kenosha Metra	Metra Trains	Global Travel
SB	5:15 AM	5:37 AM	6:18 AM	6:47 AM		6:54 AM
	5:35 AM	5:57 AM	6:38 AM	7:07 AM	7:15 AM	
	6:15 AM	6:37 AM	7:18 AM	7:47 AM	7:51 AM	
	6:35 AM	6:57 AM	7:38 AM	8:07 AM		
	7:00 AM	7:22 AM	8:03 AM	8:32 AM	8:49 AM	8:39 AM
	8:50 AM	9:12 AM	9:53 AM	10:22 AM		10:29 AM
	10:30 AM	10:52 AM	11:33 AM	12:02 PM		
	1:05 PM	1:27 PM	2:08 PM	2:37 PM	2:49 PM	2:44 PM
	2:30 PM	2:52 PM	3:33 PM	4:02 PM		4:09 PM
	3:35 PM	3:57 PM	4:38 PM	5:07 PM	5:17 PM	
	4:10 PM	4:32 PM	5:13 PM	5:42 PM	5:51 PM	
	4:30 PM	4:52 PM	5:33 PM	6:02 PM		6:09 PM
	4:45 PM	5:07 PM	5:48 PM	6:17 PM		
	5:00 PM	5:22 PM	6:03 PM	6:32 PM		
	5:15 PM	5:37 PM	6:18 PM	6:47 PM		6:54 PM
6:00 PM	6:22 PM	7:03 PM	7:32 PM			
7:00 PM	7:22 PM	8:03 PM	8:32 PM		8:39 PM	

Note: Metra train trips that are underlined and in bold are proposed add'l. train trips.



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TSM schedule and routing changes for the MCTS route through the corridor are outlined.

Compared to the Kenosha service, Metra's service to Chicago from Waukegan is much more frequent. Because of that, selected WCL runs in Table V-3 will originate or terminate in Waukegan to increase the connectivity with Illinois.

Milwaukee County Transit System

The primary MCTS service improvement assumed in the TSM Alternative is expansion of existing Route 48 (South Shore Flyer) service. This route presently starts at Ryan Road/STH 100 and South Howell Avenue, operates east on STH 100, north on STH 32/Chicago Avenue, Marquette Avenue, 10th Street, Packard Avenue, Lake Drive, Oklahoma Avenue and Highway 794 into downtown Milwaukee. This route presently operates only in the peak periods with eight morning inbound trips and seven evening outbound trips on approximately 20-minute average headways. Service is operated on weekdays only. It is estimated that 6 buses are required to operate this route.

The TSM Alternative assumes expansion of this service to include an additional two morning inbound and three afternoon outbound trips, resulting in a total of 10 trips in each peak period (approximately 15-minute frequencies). An additional two reverse peak direction trips are also proposed in each peak period, in addition to two midday round trips. Thus, a total of 28 one-way trips are proposed compared to the existing 15 one-way trips.

Routing is also slightly modified for Route 48. Service will still start at STH 100 and South Howell Avenue, and continue east on STH 100 to the proposed new Oak Creek park-and-ride lot. Passengers will be able to transfer at this location to/from the Wisconsin Coach Lines service. Service will then continue north on STH 32 to 10th Avenue in South Milwaukee and Packard Avenue in Cudahy to Layton Avenue. The



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*Other related
MCTS routes
impacted by the
KRM TSM
Alternative are
described.*

route then turns west to the proposed new Cudahy/St. Francis transit center on Kinnickinnic Avenue, near the existing train station. Buses then continue north on Kinnickinnic to Oklahoma Avenue, and then north on Highway 794 into downtown Milwaukee.

Other MCTS routes in corridor that are impacted by KRM service include:

- Route 15 – This route operates between Bayshore Mall, University of Wisconsin-Milwaukee, downtown Milwaukee, and South Milwaukee. Trips have alternative directions on a loop at the south end of a route via Packard and Pennsylvania Avenue. Service is provided on Saturdays and Sundays. No changes are proposed to this route's alignment. This route will connect to improved MCTS Route 48 service at the proposed Cudahy/St. Francis transit center.
- Route 55 – This route operates between the Southridge Shopping Center, Mitchell International Airport, St. Luke's South Shore, and Warnimont Park via 74th/76th, Layton, and Lake Drive. Weekday frequencies are 30 minutes all-day. Saturday and Sunday service is also provided. No changes are proposed to this route's alignment. This route will connect to improved MCTS Route 48 service at the proposed Cudahy/St. Francis transit center.
- Route 88 – Route 88 operates between Cudahy High School and Cudahy Middle School as a circulator service primarily via Lake Drive, College, Ramsey, Nicholson Ave, Layton and Allerton Aves. There are two trips in the morning peak period and four trips in the afternoon peak period. Saturday/Sunday service is not provided. Proposed service frequencies would improve headways to 60-minute peak/60-minute midday service, with 2-direction service on the loop route and supplemental trips as needed for school service. This improvement provides circulator service to/from the improved MCTS route 48 service at the Cudahy/St. Francis transit center.



DEFINITION OF ALTERNATIVES

- Route 89 – This route operates between the Willow Glen Grade School, St. Francis High School, and Deer Creek Grade School primarily via Kinnickinnic, Waterford, Packard, Lunham, Pennsylvania, Whitnall, Clement, Howard and Iowa. In the morning peak period, there are a total of five trips that travel counterclockwise. Two of them begin at Iowa/St. Francis and terminate at St. Francis High School. Another trip also begins at Iowa/St. Francis but terminates at Pennsylvania/Bolivar. The last two trips begin at the St. Francis High School but terminate at Iowa/St Francis and Willow Glen Grade School. In the afternoon peak period, there are three trips. One trip begins at Deer Creek Grade School and ends at St. Francis High School. The remaining afternoon trips begin at St. Francis High School and terminate at Iowa/St. Francis. Weekend service is not provided. It is proposed that this route be expanded to operate 60-minute peak/60-minute midday service, with two direction service on the loop route and with supplemental trips as needed for school service. This route's alignment is also slightly modified to connect to the Cudahy/St. Francis transit center. This improvement provides circulator service to and from the improved MCTS route 48 service at the Cudahy/St. Francis transit center.

*TSM MCTS
commuter bus stops
are defined.*

The following is a preliminary list of TSM commuter bus stops for the MCTS Route 48 service:

Oak Creek:

- Ryan & Howell
- STH 32 & STH 100
- STH 32 & Puetz

South Milwaukee:

- 10th & Milwaukee
- STH 32 & College Avenue



DEFINITION OF ALTERNATIVES

*No service changes
are proposed for
the Racine BUS*

*Expanded weekday
service of the
Kenosha local
transit system may
be desirable.*

Cudahy:

- Layton & Kinnickinnic Avenue

St. Francis:

- Howard & Kinnickinnic Avenue

Milwaukee:

- Wisconsin Avenue & Cass Street
- Wisconsin Avenue & 5th Street
- 10th & Wells

Others Transit Systems

Racine Belle Urban System

The City of Racine operates the Belle Urban System, or “the BUS.” Routes converge and pulse out of the Racine transit facility on State Street, adjacent to the railroad depot. BUS service is provided from 5:30 AM to midnight on weekdays, 5:30 AM to 10:30 PM on Saturdays, and 9:30 AM to 7:00 PM on Sundays.

Wisconsin Coach Lines service presently stops at the Racine Transit Center. Further, the span of service on Racine bus routes exceeds the proposed span of service on Wisconsin Coach Line’s service. Therefore, no service changes are proposed to Racine “BUS” service.

Kenosha Transit System

Fixed route local transit service in the City of Kenosha and surrounding area is provided by the City of Kenosha. The fixed route service converges and pulses out of the Kenosha transit center, located east of Sheridan Avenue, on 54th Street. Buses operate Monday through Friday from 6 AM to 7:30 PM and from 6 AM to 6 PM on Saturdays.



DEFINITION OF ALTERNATIVES

Although not included as a TSM Alternative service improvement, it may be desirable to consider expanded weekday service (e.g., 5:30 AM to 8:00 PM) to better accommodate early morning and late afternoon Wisconsin Coach Lines service.

Kenosha Streetcar

The Kenosha Streetcar is also located in the corridor and includes stops at the Kenosha Metra station and at the Kenosha transit center on 54th Street. No changes are proposed to Kenosha Streetcar service.

2. Bus Rapid Transit Alternative – Reserved Lanes Option

The BRT Alternative is comparable to the TSM Alternative in frequency of service, but because the BRT includes construction of reserved lanes where feasible to improve bus travel times, the BRT service is more comparable to anticipated commuter rail travel times.

Metra Service

As previously noted, the TSM Alternative proposed one additional reverse peak direction trip in each peak period. The BRT Alternative expands this service to two reverse peak direction trips. The morning reverse peak direction trips would arrive at Kenosha at 6:48 AM and 7:35 AM. The afternoon reverse peak direction trips would depart Kenosha at 5:17 PM and at 6:21 PM

BRT Service

BRT buses would operate from the Kenosha Metra station to downtown Milwaukee, following the alignment described above. The BRT service would replace existing Wisconsin Coach Lines service. Over-the-road coaches are proposed for use, similar to those presently used by

The BRT Alternative expands Metra service with two reverse peak direction trips between Kenosha and Chicago.



DEFINITION OF ALTERNATIVES

*BRT bus schedule
and fleet
requirements are
discussed.*

Wisconsin Coach Lines. As noted above, exclusive BRT lanes would be bi-directional, for use by buses operating in the peak direction of travel. Reverse peak direction buses would operate in general traffic lanes. Thus, exclusive BRT lanes south of Racine would be used by southbound buses in the morning and by northbound buses in the afternoon. Exclusive BRT lanes north of Racine would be used by northbound buses in the morning and southbound buses in the afternoon. End-to-end BRT travel time estimates in the morning are 77:27 in the northbound direction and 81:14 in the southbound direction. Travel times are reversed in the afternoon (i.e., 77:27 in the southbound direction and 81:14 in the northbound direction).

The proposed BRT bus schedule reflects expansion of the proposed TSM schedule. Bus trips have been added to serve the proposed additional Metra trains and to provide a higher level of peak-period service frequency. The proposed BRT bus schedule is shown below in **Table V-4**. Overall, a total of 42 one-way bus trips are proposed.

Allowing for turnback of equipment, the 2003 estimate of ridership, all seated passengers, selected double runs on a schedule, and ten percent spares, the total fleet of buses required to operate this schedule is 22 over-the-road buses.

Wisconsin Coach Lines Service

Existing Wisconsin Coach Lines scheduled service is eliminated or expanded to the above BRT service.



DEFINITION OF ALTERNATIVES

TABLE V-4. BRT - RESERVED LANES OPTION
 PROPOSED WEEKDAY SERVICE SCHEDULE

Direction	Metra Trains	Kenosha Metra	Racine Tr. Ctr.	Oak Creek	Pennsyl. Layton	MKE - 12th St.
NB		5:30 AM	5:57 AM	6:15 AM	6:29 AM	6:47 AM
		6:00 AM	6:27 AM	6:45 AM	6:59 AM	7:17 AM
		6:30 AM	6:57 AM	7:15 AM	7:29 AM	7:47 AM
		6:45 AM	7:12 AM	7:30 AM	7:44 AM	8:02 AM
	<u>6:48 AM</u>	7:00 AM	7:27 AM	7:45 AM	7:59 AM	8:17 AM
		7:15 AM	7:42 AM	8:00 AM	8:14 AM	8:32 AM
		7:30 AM	7:57 AM	8:15 AM	8:29 AM	8:47 AM
	<u>7:35 AM</u>	7:45 AM	8:12 AM	8:30 AM	8:44 AM	9:02 AM
		8:00 AM	8:27 AM	8:45 AM	8:59 AM	9:17 AM
	8:15 AM	8:30 AM	8:57 AM	9:15 AM	9:29 AM	9:47 AM
		10:30 AM	10:57 AM	11:15 AM	11:29 AM	11:47 AM
		12:30 PM	12:54 PM	1:15 PM	1:33 PM	1:51 PM
	2:15 PM	2:30 PM	2:54 PM	3:15 PM	3:33 PM	3:51 PM
		4:00 PM	4:24 PM	4:45 PM	5:03 PM	5:21 PM
		4:30 PM	4:54 PM	5:15 PM	5:33 PM	5:51 PM
		5:00 PM	5:24 PM	5:45 PM	6:03 PM	6:21 PM
		5:30 PM	5:54 PM	6:15 PM	6:33 PM	6:51 PM
	5:39 PM	5:45 PM	6:09 PM	6:30 PM	6:48 PM	7:06 PM
		6:00 PM	6:24 PM	6:45 PM	7:03 PM	7:21 PM
	6:30 PM	6:30 PM	6:54 PM	7:15 PM	7:33 PM	7:51 PM
7:10 PM	7:15 PM	7:39 PM	8:00 PM	8:18 PM	8:36 PM	

A preliminary BRT Alternative-Reserved Lanes Option operating schedule is defined.

Direction	MKE - 12th/St.	Pennsyl. Layton	Oak Creek	Racine Tr.Ctr.	Kenosha Metra	Metra Trains
SB	5:23 AM	5:41 AM	5:59 AM	6:20 AM	6:45 AM	
	5:38 AM	5:56 AM	6:14 AM	6:35 AM	7:00 AM	7:15 AM
	5:53 AM	6:11 AM	6:29 AM	6:50 AM	7:15 AM	
	6:23 AM	6:41 AM	6:59 AM	7:20 AM	7:45 AM	7:51 AM
	6:53 AM	7:11 AM	7:29 AM	7:50 AM	8:15 AM	
	7:08 AM	7:26 AM	7:44 AM	8:05 AM	8:30 AM	8:49 AM
	7:53 AM	8:11 AM	8:29 AM	8:50 AM	9:15 AM	
	8:53 AM	9:11 AM	9:29 AM	9:50 AM	10:15 AM	
	10:53 AM	11:11 AM	11:29 AM	11:50 AM	12:15 PM	
	1:12 PM	1:30 PM	1:44 PM	2:02 PM	2:30 PM	2:49 PM
	2:57 PM	3:15 PM	3:29 PM	3:47 PM	4:15 PM	
	3:27 PM	3:45 PM	3:59 PM	4:17 PM	4:45 PM	
	3:57 PM	4:15 PM	4:29 PM	4:47 PM	5:15 PM	<u>5:17 PM</u>
	4:12 PM	4:30 PM	4:44 PM	5:02 PM	5:30 PM	
	4:27 PM	4:45 PM	4:59 PM	5:17 PM	5:45 PM	5:51 PM
	4:42 PM	5:00 PM	5:14 PM	5:32 PM	6:00 PM	
	4:57 PM	5:15 PM	5:29 PM	5:47 PM	6:15 PM	<u>6:21 PM</u>
	5:12 PM	5:30 PM	5:44 PM	6:02 PM	6:30 PM	
	5:27 PM	5:45 PM	5:59 PM	6:17 PM	6:45 PM	
	5:57 PM	6:15 PM	6:29 PM	6:47 PM	7:15 PM	
	6:57 PM	7:15 PM	7:29 PM	7:47 PM	8:15 PM	

Note: Metra train trips underlined and in bold are proposed additional KRM trips.



DEFINITION OF ALTERNATIVES

Milwaukee County Transit System

The following changes are proposed to MCTS Service:

- Route 48 – Service at No-Build Alternative service levels. This route would connect to new BRT bus service at the Oak Creek park-and-ride lot.
- Route 15 – This route’s alignment is modified at Rawson to connect to the proposed BRT stop at Rawson and Pennsylvania. No changes are proposed to Route 15 service frequencies.
- Route 55 – No changes are proposed to this route’s alignment or service frequencies. This route connects to BRT service at the proposed Layton/Pennsylvania BRT stop.
- Route 88 – This route’s alignment is modified to connect to the Layton/Pennsylvania BRT stop. Service frequencies are improved to 60 minutes (peak and midday) with two-direction service on the loop route and with supplemental trips as needed for school service (same as in the TSM Alternative).
- Route 89 – No changes are proposed to this route’s alignment. This route connects to the Layton/Pennsylvania BRT stop. Service frequencies are improved to 60 minutes peak and midday with two-direction service on the loop route and with supplemental trips as needed for school service (same as in the TSM Alternative).
- Airport Shuttle – This is a proposed new route that operates between the Pennsylvania/Layton BRT stop and the Mitchell International Airport via Layton Avenue, Howell Avenue and the airport spur road. Proposed frequencies are 15 minutes in the peak periods and limited service in the midday to meet with BRT buses.

Changes are proposed for MCTS service in the BRT Alternative.



DEFINITION OF ALTERNATIVES

No changes are proposed for the Racine BUS or Kenosha transit system and street car.

The Commuter Rail Alternative Independent Option introduces rail service between Kenosha and Milwaukee with an operation separate from Metra.

Other Transit Systems

Racine Belle Urban System

No changes are proposed to the Racine “BUS” system, because the proposed BRT service connects to the Racine transit system at the transit center and the current hours of that service are good.

Kenosha Transit System and Streetcar

No changes are proposed to the Kenosha Transit System. As noted in the TSM Alternative, it may be desirable to consider expanded weekday service (e.g., 5:30 AM to 8:00 PM) to better accommodate early morning and evening BRT service.

3. Commuter Rail Alternative – Independent Option

The primary element of the Commuter Rail Alternative – Independent Option is new commuter rail service between the Kenosha Metra station and the Milwaukee Amtrak Station, with select trips extending into Illinois – either to downtown Chicago or Waukegan. This service would be provided by an independent commuter rail agency.

Following are detailed descriptions of proposed transit operations for the Commuter Rail – Independent Option Alternative.

Commuter Rail Service

The proposed commuter rail service would operate on existing tracks between the Kenosha Metra station and the Milwaukee Amtrak station. Intermediate stops between Kenosha and Milwaukee are proposed at Somers, the Racine Transit Center, Caledonia, Oak Creek, South Milwaukee and Cudahy/St. Francis. Thus, there are a total of 8 station



DEFINITION OF ALTERNATIVES

It would not be cost effective to upgrade the track to class 4.

stops, including the ends-of-line stops. Diesel multiple units (DMUs) are proposed as the mode of operation.

Preliminary travel times are based on estimates from the 2003 study.⁴⁷ Two different maximum speeds were studied: 59 mph (from the current employee timetable) and 79 mph (assuming an upgrade to Class 4 track). The total difference in travel time was 3 ½ minutes, while the cost for the associated track upgrade from Federal Railroad Administration (FRA) class 3 to class 4 track might be \$600,000 per mile for 30 miles or more for a total cost of \$18 to 20 million. That expense for a relatively few minute improvement in schedule is not considered cost effective, so the current 59 mph passenger train speed is used in this study. Estimated station-to-station travel times are presented in **Table V-5**. The estimated full route travel time between Kenosha and Milwaukee is approximately 57-58 minutes.

**TABLE V-5. COMMUTER RAIL TRAVEL TIME ESTIMATES
 KENOSHA METRA TO MILWAUKEE**

Station-to-Station Pair	Travel Time Estimate
Kenosha Metra to Somers	6 minutes
Somers to Racine Transit Center	9 minutes
Racine Transit Center to Caledonia	6 minutes
Caledonia to Oak Creek	9 minutes
Oak Creek to South Milwaukee	5 minutes
South Milwaukee to Cudahy/St. Francis	7 minutes
Cudahy/St. Francis to South Side Milwaukee	8 minutes
South Side Milwaukee to Milwaukee Amtrak Depot	7 minutes
Total Travel Time Estimate	57 minutes

⁴⁷ Technical Report No. 7, Analysis of Railroad Impacts, SEWRPC, June 2001, Tables 2 and 3.



DEFINITION OF ALTERNATIVES

The proposed commuter rail operating plan is outlined.

The proposed commuter rail operating plan consists of 20 one-way trips (10 in each direction). The number of one-way trips is slightly higher than the number of one-way trips proposed in the 2003 KRM study's "Medium Level of Service" scenario, where 14 one-way trips were assumed. **Table V-6** presents a proposed commuter rail train schedule for this alternative. Most trips would begin and end service at Kenosha. Several of these trips are scheduled to provide a timed meet with existing Metra service for cross-platform transfers. Select trips have also been extended to either Chicago or Waukegan, as identified in the proposed schedule. This alternative assumes that KRM DMU service is permitted to operate limited service on the UP line in Illinois with costs and revenues prorated based on the location of ridership.

Service to Chicago would involve cross platform transfers at Kenosha and Waukegan, and some direct trains to Chicago.

Overall, this alternative has timed meets at Kenosha with Metra service for 8 of the 20 one-way DMU trips. Furthermore, of the remaining 12 DMU one-way trips, four are operated in Illinois to/from Waukegan and another four operate to/from Chicago. Thus, a total of 12 of the 20 trips have cross-platform transfers to Metra service at either Waukegan or Kenosha, and an additional four trips have one-seat rides to/from downtown Chicago. For the ridership projected in the 2003 study, and the proposed schedule, a fleet of five trains is needed. Each train is composed of two double-deck diesel multiple unit and a double-deck cab-coach. **Table V-6** details the proposed schedule.



DEFINITION OF ALTERNATIVES

TABLE V-6. COMMUTER RAIL
PROPOSED WEEKDAY SCHEDULE

*A preliminary
commuter rail
operating schedule
is provided for the
Commuter Rail
Alternative –
Independent
Option.*

KRM Northbound Trains												Timed meets w/ Metra service?
Run #	Chicago	Waukegan	Kenosha Metra	Somers	Racine Tr. Ctr.	Caledonia	Oak Creek	South Milwaukee	Cudahy/ St. Francis	Bay View	MKE Amtrak	
001	----	----	5:40 AM	5:44 AM	5:53 AM	5:59 AM	6:07 AM	6:12 AM	6:17 AM	6:24 AM	6:32 AM	No
003	5:06 AM	6:11 AM	6:35 AM	6:39 AM	6:48 AM	6:54 AM	7:02 AM	7:07 AM	7:12 AM	7:19 AM	7:27 AM	N/A - KRM service from Chicago
005	6:06 AM	7:11 AM	7:35 AM	7:39 AM	7:48 AM	7:54 AM	8:02 AM	8:07 AM	8:12 AM	8:19 AM	8:27 AM	N/A - KRM service from Chicago
007	----	----	8:30 AM	8:34 AM	8:43 AM	8:49 AM	8:57 AM	9:02 AM	9:07 AM	9:14 AM	9:22 AM	Yes - 8:20 am NB train at Kenosha
009	----	10:08 AM	10:32 AM	10:36 AM	10:45 AM	10:51 AM	10:59 AM	11:04 AM	11:09 AM	11:16 AM	11:24 AM	Yes - 9:50 am NB train at Waukegan
011	----	12:56 PM	1:20 PM	1:24 PM	1:33 PM	1:39 PM	1:47 PM	1:52 PM	1:57 PM	2:04 PM	2:12 PM	Yes - 12:50 am NB train at Waukegan
013	----	----	2:32 PM	2:36 PM	2:45 PM	2:51 PM	2:59 PM	3:04 PM	3:09 PM	3:16 PM	3:24 PM	Yes - 2:15 pm NB train at Kenosha
015	----	4:46 PM	5:10 PM	5:14 PM	5:23 PM	5:29 PM	5:37 PM	5:42 PM	5:47 PM	5:54 PM	6:02 PM	No - 4:50 pm NB train at Waukegan
017	----	----	6:55 PM	6:59 PM	7:08 PM	7:14 PM	7:22 PM	7:27 PM	7:32 PM	7:39 PM	7:47 PM	Yes - 6:32 & 6:40 pm NB train at Kenosha
019	----	----	7:20 PM	7:24 PM	7:33 PM	7:39 PM	7:47 PM	7:52 PM	7:57 PM	8:04 PM	8:12 PM	Yes - 7:10 pm NB train at Kenosha

KRM Southbound Trains												Timed meets w/ Metra service?
Run #	MKE Amtrak	Bay View	Cudahy/ St. Francis	South Milwaukee	Oak Creek	Caledonia	Racine Tr.Ctr.	Somers	Kenosha Metra	Waukegan	Chicago	
002	5:50 AM	5:56 AM	6:03 AM	6:09 AM	6:14 AM	6:22 AM	6:28 AM	6:36 AM	6:42 AM	----	----	Yes - 6:53 am SB train at Kenosha
004	6:45 AM	6:51 AM	6:58 AM	7:04 AM	7:09 AM	7:17 AM	7:23 AM	7:31 AM	7:37 AM	----	----	Yes - 7:51 am SB train at Kenosha
006	7:45 AM	7:51 AM	7:58 AM	8:04 AM	8:09 AM	8:17 AM	8:23 AM	8:31 AM	8:37 AM	9:01 AM	----	Yes - 8:49 am SB train at Kenosha
008	10:45 AM	10:51 AM	10:58 AM	11:04 AM	11:09 AM	11:17 AM	11:23 AM	11:31 AM	11:37 AM	12:01 PM	----	Yes - 12:10 pm SB train at Waukegan
010	1:30 PM	1:36 PM	1:43 PM	1:49 PM	1:54 PM	2:02 PM	2:08 PM	2:16 PM	2:22 PM	----	----	No, but 2:49 pm SB train at Kenosha
012	2:45 PM	2:51 PM	2:58 PM	3:04 PM	3:09 PM	3:17 PM	3:23 PM	3:31 PM	3:37 PM	4:01 PM	----	Yes - 4:10 pm SB train at Waukegan
014	4:23 PM	4:29 PM	4:36 PM	4:42 PM	4:47 PM	4:55 PM	5:01 PM	5:09 PM	5:15 PM	5:39 PM	6:44 PM	N/A - KRM service to Chicago
016	5:23 PM	5:29 PM	5:36 PM	5:42 PM	5:47 PM	5:55 PM	6:01 PM	6:09 PM	6:15 PM	6:39 PM	7:44 PM	N/A - KRM service to Chicago
018	6:12 PM	6:18 PM	6:25 PM	6:31 PM	6:36 PM	6:44 PM	6:50 PM	6:58 PM	7:04 PM	----	----	No
020	8:15 PM	8:21 PM	8:28 PM	8:34 PM	8:39 PM	8:47 PM	8:53 PM	9:01 PM	9:07 PM	----	----	No

Limited service will be provided between Waukegan and Chicago. Stops will be the same as or at least very similar to those shown in the added Metra run for the TSM.

Wisconsin Coach Lines

Current service to the airport would be replaced by the MCTS airport shuttle route.

Milwaukee County Transit System

The following changes are proposed to MCTS Service:

- Route 48 – Service is eliminated and replaced with commuter rail service and improved local bus service.
- Route 15 – No changes are proposed to this route’s alignment or service frequencies. This route connects to commuter rail service at the proposed Cudahy/St. Francis and South Milwaukee stations.



DEFINITION OF ALTERNATIVES

Changes proposed to the MCTS service for the Commuter Rail Alternative are discussed.

- Route 55 – No changes are proposed to this route’s alignment or service frequencies. This route connects to commuter rail service at the proposed Cudahy/St. Francis commuter rail station.
- Route 88 – No changes are proposed to this route’s alignment. Service frequencies, however, are improved to 60-minute frequencies (peak and midday) with two-direction service on the loop route and with supplemental trips as needed for school service (same as in the TSM and BRT Alternatives).
- Route 89 - This route’s alignment is modified to connect to the Cudahy/St. Francis commuter rail station. Service frequencies are improved to 60-minutes (peak and midday) with 2-direction service on the loop route and with supplemental trips as needed for school service (same as in the TSM and BRT Alternatives).
- Airport Shuttle – This is a proposed new route that operates between the Cudahy/St. Francis commuter rail station and Mitchell International Airport via Layton Avenue and Howell Avenue to the airport spur road. Proposed arrivals and departures are scheduled to meet the KRM rail service.
- Downtown Circulators – These are two proposed new routes that operate between the Milwaukee Amtrak station and other locations in downtown Milwaukee. Proposed routing for the East CBD route is north on 4th Street, east on Wisconsin, south on Van Buren and west on Michigan, back to 4th Street. Proposed routing for the West CBD route is north on 4th Street, west on Wisconsin, north on 12th Street and east on Wells, back to 4th Street. Proposed frequencies are approximately 30 minutes in the peak periods, with limited midday trips to meet proposed midday commuter rail trips.



DEFINITION OF ALTERNATIVES

No charges are proposed in the Racine BUS, Kenosha Transit System or Kenosha Streetcar.

Other Transit Systems

Racine Belle Urban System

No changes are proposed to the Racine "BUS" system, since proposed commuter service connects to the Racine transit system at the transit center.

Kenosha Transit System and Streetcar

No changes are proposed to the Kenosha Transit System. As noted in the TSM and BRT Alternatives, it may be desirable to consider expanded weekday service (e.g., 5:30 AM to 8:00 PM) to better accommodate early morning and late afternoon commuter rail service.

4. Commuter Rail Alternative - Through Service Option

This commuter rail alternative takes the cost effectiveness of DMUs tailored to demand from the Independent Option one step further. It assumes that a single coordinating entity optimizes commuter rail operation over the full length of the Milwaukee-Chicago (Wisconsin-Illinois) UP alignment. For example, this might be the UP, perhaps with assistance from a subcontractor or partner, under separate purchase of service agreements with Metra and the Wisconsin RTA. Or it might be a new bi-state coordinating board that receives the service requirements from Metra and the Wisconsin RTA and in turn purchases service from the UP. This Through Service Option would negotiate a more optimal schedule that meets the travel needs of the KRM corridor in Wisconsin, respects the existing Metra service in Illinois, and is responsive to the UP's requirements. It would attempt to eliminate most, if not all, cross-platform transfers that are required in the Independent Option. Rolling stock would also be optimized for cost effectiveness with combined use of both



DEFINITION OF ALTERNATIVES

Metra will not support the Through Service Option so full schedules have not been developed.

locomotive-hauled trains and DMU's. This integration of service would also prorate revenues and costs back to Metra and the Wisconsin RTA on an equitable basis.

Under this alternative, the level of train service in the KRM corridor is assumed to be similar to the level of service identified in the Independent Option. However, the optimized service would eliminate the transfer time between KRM and Metra trains (typically scheduled as 10 minutes) and is likely to provide a net cost savings when considering both the existing Metra service and the Commuter Rail - Independent Option discussed earlier.

As indicated earlier, Metra will not support this operation. Therefore, this option has been set aside.

5. Summary of Schedules

Table V-7 provides a summary of the service characteristics of the various alternatives. All of the levels of service were chosen to be roughly equivalent and representative of a full build out (FBO) system.

Once the ridership model is completed, calibrated and verified, additional ridership parametric modeling work will be performed later in the project to determine if some simplified version of the FBO system is practical. As discussed earlier, that simplified system would be the minimum operable segment (MOS) for the initial start-up of the system.

Future expansions of service are also possible for all alternatives, not only with more frequent service, but also with the addition of more service choices or improved facilities (bus lanes, rail stations and tracks, alternate routes, mid-route turn-backs, etc.).



DEFINITION OF ALTERNATIVES

A summary of service characteristics is provided.

TABLE V-7. COMPARISON OF SERVICE FOR VARIOUS ALTERNATIVES AND OPTIONS

	Northbound (Southbound is similar)									
	Kenosha to Milwaukee				Total	New Early Trains: Number & Agency	Connecting Trains from Illinois			Single Seat from Chicago
	Total Round Trips	Direct	Via GMIA	Kenosha to Milwaukee Travel Time			Type	Transfers		
								Kenosha	Waukegan	
Current	8	0	8	1:23	3	0	Rail-to-Bus	3	0	0
TSM	14	0	14	1:31*	5	1 - Metra	Rail-to-Bus	5	0	0
BRT Shared Lanes	14	6	8	1:17	7	2 - Metra	Rail-to-Bus	7	0	0
CR Independent	10	10	0	:57	9	2 - KRM	X-Platform	5	2	2
CR Thru Service	10	10	0	:57	9	2 - TBD	**	0	0	9

Except for the TSM and BRT "New Early Trains" noted above, the schedules upon which these results are based assumed no changes to the current Metra UP-North schedule (effective January 23, 2006).

"X-Platform" = Cross Platform

* = The TSM travel times are the same as Current times but with an allowance for increased congestion in the future.

** = No transfer is needed between KRM and Metra. Therefore, there is a net travel time saving equal to the transfer time of other CR Options (typically 10 minutes).

General conclusions from this table are:

- Comparing BRT to TSM, the BRT offers more frequent service, an 18% savings in total travel time between Kenosha and Milwaukee, and better connections with Metra's Illinois service than TSM.
- Comparing BRT to commuter rail, the BRT again has more frequent trips and a choice of two routing alternatives (via GMIA or not). However, the commuter rail has a 25% savings in travel time north to Milwaukee and much better connections south to Illinois.
- Comparing commuter rail alternatives, the Through Service Option has no difference in service between Kenosha and Milwaukee, but offers an improved single-seat ride south to Illinois and a 10-minute trip time savings arising from elimination of a transfer.



DEFINITION OF ALTERNATIVES

VI. SUMMARY

Several transit modes alternatives or options have been screened out of future consideration.

The transit modes selected for further study are listed.

A first level screening process has been applied to a wide variety of transit alternatives, including those originally studied in the 1981,⁴⁸ 1982,⁴⁹ 1998⁵⁰ and 2003 KRM⁵¹ studies.

The following alternatives or alternative options were screened out from further consideration:

- Moving Way Transit
- Monorails
- Automated Guideway Transit
- Trolley Bus
- Heavy Rail Transit
- Bus Rapid Transit (BRT) – Exclusive Running Way Option
- Streetcar and Light Rail Transit
- Rail and Bus
- Commuter Rail - Through Service Locomotive-Hauled Option

The following Alternative-Options have passed through this initial screening and will be carried forward into the detailed analysis phase of the study:

- No-Build
- Transportation System Management (TSM)
- Baseline (A future choice or combination of between No-Build and TSM)
- BRT – Reserved Lanes Option
- Commuter Rail – Independent Option
- Commuter Rail – Through Service Option

⁴⁸ *Op. cit.*, Regional Planning Commission, February 1981.

⁴⁹ *Op. cit.*, Regional Planning Commission, June 1982.

⁵⁰ *Op. cit.*, Regional Planning Commission, June 1998.

⁵¹ *Op. cit.*, Regional Planning Commission, August 2003.



DEFINITION OF ALTERNATIVES

The four primary alternatives are summarized below.

1. Transportation System Management (TSM)

This alternative is a comparatively low-cost upgrade of existing commuter bus transit in the corridor. Improvements include expanded schedules, traffic signal prioritization, additional park-and-ride spaces, assistance in forming transportation management associations among area employers, and passenger information systems at bus stops. However, increasing speeds on existing roads in the KRM corridor, even with significant capital investment, is not practical because of roadway characteristics and neighboring development. Existing local speed limits established will still govern operating speed of the TSM Alternative.

The TSM Alternative includes a pair of additional Metra trains added to the current UP-North service to Kenosha, one northbound in early morning and one southbound in the afternoon. These trains will allow commuters to connect with the commuter bus service to Milwaukee for the business day.

2. Bus Rapid Transit Alternative – Reserved Lanes Option

Because it is infeasible to add bus travel lanes in the corridor's urban areas without extensive takings, and because landowners and other stakeholders have rejected overtures concerning converting either rail or recreation ROW to high-speed bus use, the BRT Alternative is focused on increasing the speeds under which the commuter buses operate by creating specific lanes on existing roads wherever feasible.

This TSM Alternative is a low cost commuter bus upgrade with one pair of Metra Chicago-centric reverse commute trains.

The BRT Alternative-Reserved Lanes Option uses exclusive single lanes on existing urban arteries and two pair of extra Chicago-centric reverse commute trains.



DEFINITION OF ALTERNATIVES

Improvements for the BRT – Reserved Lanes Option include:

- Reserved, exclusive use lanes on most rural and suburban segments of a route utilizing STH 32 in Kenosha County and southern Racine County; STH 38 and STH 31, returning to STH 32 in northern Racine and southern Milwaukee Counties; STH 100, Pennsylvania Avenue, STH 794 and I-794 in Milwaukee County. Some reserved lanes would be separated by lane dividers from general traffic flow.
- Park-and-Ride lots at select BRT stops.
- Traffic signal prioritization.

Transit stops would be located in Kenosha, Somers, Racine, Caledonia, Oak Creek, South Milwaukee, Cudahy/St. Francis and downtown Milwaukee.

Peak period Metra UP-North rail service is assumed to expand with one additional pair (i.e., two pairs total from current schedule) of trains beyond the TSM.

3. Commuter Rail Alternative – Independent Option

This alternative is a free-standing commuter rail service operated by the Wisconsin RTA without impacting the existing Metra UP-North service. Train sizes and service are tailored to the specific demands of the KRM corridor using self-contained, efficient, diesel multiple unit (DMU) railcars. The railcars would likely be owned by the newly created Wisconsin Regional Transit Authority (RTA), which might contract directly with the UP for the service.

The service would be coordinated with Metra for timed transfers to and from the existing UP-North service at Kenosha or Waukegan. In addition, two very early morning KRM DMUs would be run in existing open time slots in the Metra schedule from Chicago in limited-stop service to

The Commuter Rail Alternative-Independent Option uses diesel multiple units operating down to Kenosha, Waukegan, and Chicago.



DEFINITION OF ALTERNATIVES

Kenosha, continuing north in normal KRM service, and arriving in Milwaukee before the start of the normal business day. A similar pair of trains also makes the late afternoon single-seat trip to Chicago.

As is the case for the BRT Alternative, the five (5) basic and three (3) possible additional station locations from the 2003 KRM study are included in this alternative. Two rail concept changes from the 1998 and 2003 KRM studies will also be pursued:

1. Maintenance and storage facilities will be tailored to DMUs rather than locomotive-hauled trains.
2. Selected extensions of railroad passing sidings will provide more instances of two tracks at station platforms.

4. Commuter Rail Alternative – Through Service Option

This alternative assumes that a single coordinating entity optimizes commuter rail operation over the full length of the Milwaukee-Chicago UP alignment, negotiating a schedule that meets the travel needs of the KRM corridor in Wisconsin, respects the existing Metra service in Illinois, and is responsive to the UP's requirements. It would attempt to eliminate most, if not all, cross-platform transfers that are required in the Independent Option for riders traveling between Wisconsin and Illinois. Rolling stock would also be optimized for cost effectiveness with combined use of both locomotive-hauled trains and DMUs over peak, midday, weekend, holiday and special event service. This integration of service would also prorate revenues and costs back to Metra and the Wisconsin RTA on an equitable basis.

Under this option, the level of regular train service and station locations in the KRM corridor is assumed to be similar to those of the Independent Option, but the optimized service would provide savings not only relative to the KRM Independent Option service, but also for the existing Metra

The Commuter Rail Alternative – Through Service Option has potential cost savings but is not supported by Metra.



DEFINITION OF ALTERNATIVES

service. Metra will not support this option so no further work has been done on it. It is retained only as a placeholder to be checked again with Metra before the start of final design.

Table VI-1 summarizes the alternatives and options with bulleted lists of the General Design Guidelines and the Specific Characteristics.

TABLE VI-1. SUMMARY OF ALTERNATIVES

Transportation System Management (TSM):

General Design Guidelines:

- No major capital investment
- Improved commuter bus
- Improved park-and-ride lots
- No local bus speed limit improvements possible

Specific Characteristics:

- Oak Creek Park-and-Ride (STH 32 & 100)
- Cudahy/St. Francis Transit Center (Kinnickinnic and Layton)
- Traffic Signal Prioritization (STH 32, S. Packard and N. Chicago, STH 794)
- Service Improvements:
 - WCL Commuter Bus: Increase from 16 to 28 total one-way trips per day
 - MCTS:
 - Route 48: Increase from 15 to 28 total one-way trips per day
 - Local Bus:
 - #88: Increase frequency
 - #89: Increase frequency and connect to Cudahy/St. Francis Transit Center
- Passenger Information System (next arrivals)
 - Kenosha Metra

A Summary of Alternatives table is provided.



DEFINITION OF ALTERNATIVES

A Summary of
Alternatives table is
provided.

- Kenosha Transit Center
- Racine Transit Center
- Cudahy/St. Francis Transit Center
- Several in downtown Milwaukee
- One added Metra train each direction

Bus Rapid Transit – Reserved Lanes Option:

General Design Guidelines:

- All TSM improvements plus reserved bus lanes where feasible in rural and suburban areas

Specific Characteristics:

- All TSM Improvements
- Reserved bus lanes on STH 32 in Kenosha County, and on portions of roadways in Racine and Milwaukee Counties.
- Bus Service Improvements:
 - Commuter Bus: Reduce travel time from 100 to 77 minutes one way
- Two added Metra trains each direction

Commuter Rail – Independent Option:

General Design Guidelines:

- Wisconsin RTA operate separately
- Smaller trains tailored to demand
- Meet available Metra trains with cross-platform transfers

Specific Characteristics:

- Diesel multiple units (DMUs)
- Kenosha to Milwaukee travel time: 57 minutes
- 20 total one-way trips
- Outside the peak and mid-day periods, add through trains from/to Chicago
 - Available windows to be defined by Metra
 - Two very early trains arriving in Milwaukee before 8 AM.



DEFINITION OF ALTERNATIVES

*A Summary of
Alternatives table is
provided.*

- Two trains departing Milwaukee after 5 PM.
- Midday cross-platform transfers with Metra trains:
 - Kenosha
 - Waukegan
- Stations:
 - Basic:
 - Kenosha
 - Racine
 - Cudahy/St. Francis
 - South Side Milwaukee
 - Milwaukee
 - Future Stations:
 - Somers
 - Caledonia
 - Oak Creek
 - South Milwaukee

Commuter Rail – Through-Service Option:

General Design Guidelines:

- Provides same service as Independent Option
- Schedules and train equipment are optimized for both Illinois and Wisconsin
- Eliminates or at least minimizes cross-platform transfers
- Attempts to achieve a win-win for Wisconsin and Metra

Specific Characteristics:

- Optimizes choice of diesel multiple units (DMUs) and locomotive-hauled trains
- Provides same schedule and stations as Independent Option
- The institution to achieve this is not yet defined. Could be some combination of:
 - Wisconsin RTA
 - UPRR



DEFINITION OF ALTERNATIVES

*A Summary of
Alternatives table is
provided.*

- Metra
 - Bi-state coordinating board
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