METRA UP-W LINE

Cook, Kane, and DuPage Counties

Illinois

Alternatives Analysis Study

Document #9

Locally Preferred Alternative Report

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Prepared by

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Alternatives Analysis Documents

- Document #1: Scope of Work
- Document #2: Purpose and Need
- Document #3: Initial Alternatives, Part I Modes and Technologies
- Document #4: Evaluation Methodology
- Document #5: Initial Alternatives, Part I Screening and Part II Conceptual Design
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- **Document #9: Locally Preferred Alternative Report**

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1.0 Introduction

1.1 Purpose and Organization

This is Document #9: Locally Preferred Alternative Report of the Union Pacific-West (UP-W) Line Upgrade study. The purpose of this report is to document the process used to select a Locally Preferred Alternative (LPA) to be recommended for further study as part of the New Starts process. The report is organized as follows:

- Section 1.0 provides an overview of the purpose and organization of the report and includes background information regarding the study area; purpose and need for improvements; goals and objectives; and the methodology used to conduct the Alternatives Analysis.
- Section 2.0 includes a summary of the outcome of each step in the Alternatives Analysis process.
- Section 3.0 documents the public involvement effort and summarizes public, agency, and stakeholder comments.
- Section 4.0 provides a detailed description of the LPA, including infrastructure changes and requirements, proposed operating schedule, rolling stock requirements, and signals and communication needs.
- Section 5.0 includes a projected implementation schedule.
- Section 6.0 provides estimates of both capital and operating costs.
- Section 7.0 documents the ridership projections, including the transportation system user benefits.
- Section 8.0 summarizes the next steps for implementation of the LPA.

1.2 Background

Metra initiated this study to identify, evaluate, and select potential transit improvements in the study area. The formal study process is referred to as an Alternatives Analysis, which is a study organized to bridge the gap between the more "broad-brush" system-wide planning activities and corridor- or project-level preliminary engineering. As the name implies, an Alternatives Analysis is focused on developing and evaluating (according to a set of defined criteria at the outset) a set of all reasonable alternatives with the express purpose of recommending one alternative for further environmental documentation and preliminary engineering analyses. This recommended alternative is commonly referred to as a Locally Preferred Alternative.

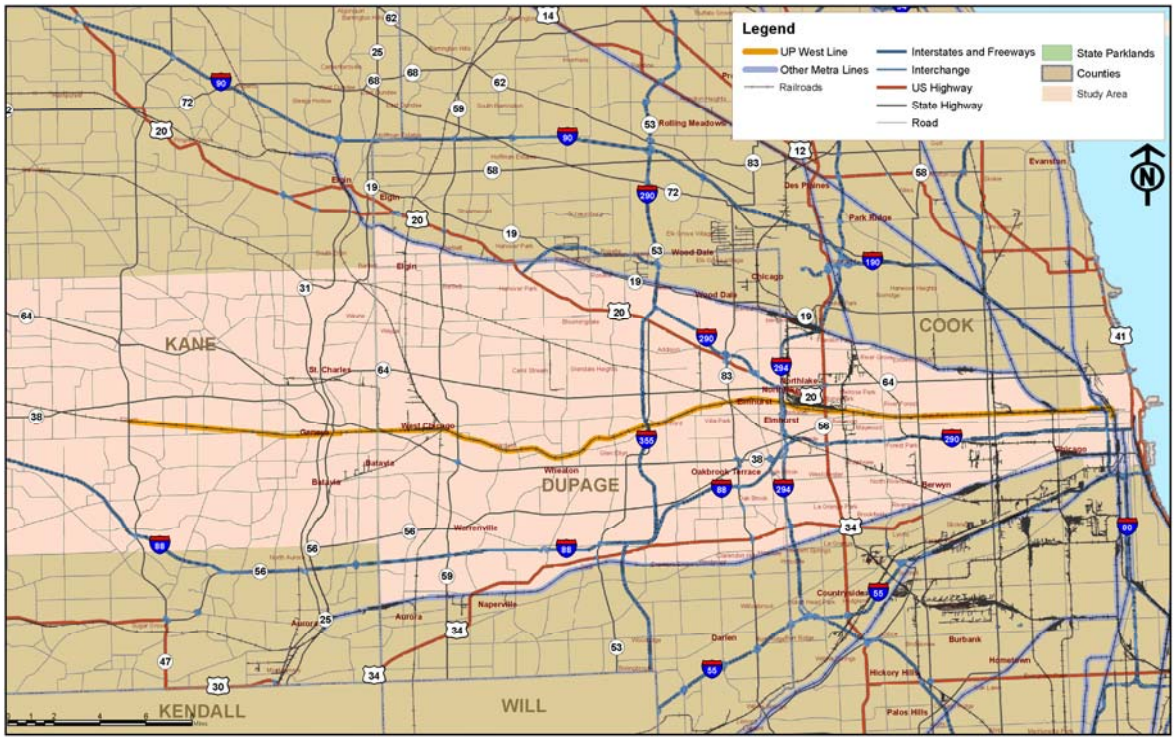
1.2.1 Study Area

The study area is defined as the area including:

- The Central Business District (CBD) of Chicago;
- Those portions of the City of Chicago, Cook County, and DuPage County bounded by Metra's Milwaukee District West (MD-W) and BNSF Lines; and,
- Batavia Township, Geneva Township, St. Charles Township, Blackberry Township, and Campton Township in Kane County.

As shown in Figure 1.1, the study area fans out as it moves westward. This reflects the typical travel shed of a regional transit service—traffic congestion decreases further away from the city, making stations at the outskirts of the study area more accessible to a wider geographic area.

Figure 1.1: Map of the Study Area



Sources: IDOT (Road), Metra (Rail)

1.2.2 Purpose and Need for Improvements

The purpose of the UP-W Line Upgrade study is to examine whether transit improvements within the study area can help: (1) relieve congestion, (2) meet the area's mobility needs, (3) provide opportunities to satisfy the growing non-traditional travel market needs (e.g. reverse-commute and suburb-to-suburb trips), and (4) maintain the competitive advantage of the study area as an economic engine and international freight and passenger transportation hub. In fulfilling these purposes, the study seeks to address the following needs in the study area:

- Relieve pressures put on the existing transportation network by the growth of activity centers.
- Encourage transit-supportive patterns of development that are more easily sustained.
- Respond to the growth in the demand for midday, intermediate, and reverse-commute trips.
- Improve regional transportation capacity without adversely impacting the natural and built environment.

- Ensure Chicago retains its role as an international freight and passenger transportation hub.
- Help the region meet the National Ambient Air Quality Standards (NAAQS).

These points are described in greater detail in *Document #2: Purpose and Need* (June 9, 2006). The *Purpose and Need* concluded that it will be necessary to develop transportation solutions that leverage the investments already made in the existing infrastructure. This is a result of two inherent factors: (1) limited opportunities for adding roadway capacity, and (2) constraints on the railroads in the study area. Specific roadway and railroad constraints are summarized below.

- Large sections of the east-west highway network in the study area are currently operating beyond capacity for significant portions of the day.
- According to the Chicago Metropolitan Agency for Planning Transportation Improvement Program for Northeastern Illinois, FY 2007-2012, the only roadway capacity expansions in the study area will be limited to implementation of Open Road Tolling (ORT) in the I-88 corridor.
- Further expansion of these and other east-west roadways will be difficult to accommodate without major disruptions or impacts to communities within the study area.
- Metra's existing infrastructure in the study area has reached its operating capacity; any service increase would therefore require major infrastructure changes.
- Commuter rail services in the study area are further constrained by the need to operate along active freight railroads. In 2004, delays resulting from freight traffic, as a percentage of all Metra train delays, ranged from 13 percent along the BNSF to 39 percent on the UP-W. The lower amount of delay on the BNSF reflects the superior operating efficiency of its physical plant compared to that of the UP-W.
- The configuration of the A-2 interlocking (the intersection of the UP-W with the MD-W, MD-N, and NCS lines) slows trains and further reduces on-time performance.

An analysis of current commuting patterns indicates that transit plays a significant role in the study area, especially for those trips headed towards the CBD. Roughly half of the work trips destined for the CBD in the medium- and long-distance travel markets utilize commuter rail. As highway congestion continues to increase in the region, there will be a growing need for fixed guideway transit services in the study area to provide viable alternatives to automobile travel.

As demand for Metra services has grown, the demands on the facilities of the UP-W and BNSF are exceeding what can be handled through system preservation alone. To address the constraints of the existing commuter rail lines, there is a need for new investments in fixed guideway transit in the study area.

1.2.3 Goals and Objectives

The needs expressed above explain why the UP-W Line Upgrade is being studied. To determine if the alternatives proposed by this study could meet the needs listed above, it was necessary to establish an appropriate set of goals and objectives. The goals and objectives were established in *Document #2, Purpose and Need* and are presented in Table 1.1 of this report. These goals and objectives established benchmarks against which the proposed alternatives could be measured for their ability to meet the purpose and need of the study.

Table 1.1: Goals and Objectives

Goal	Objectives
Goal 1: Improve Mobility	• Improve transit services to existing activity centers within the study area • Increase ridership on existing transit lines • Relieve existing passenger congestion on the BNSF • Maintain transit travel times on existing services which are competitive with auto travel times between stations
Goal 2: Improve Reliability of Existing Service	• Improve on-time performance of existing transit services • Provide the operational flexibility necessary to improve services and incident management on existing transit lines • Allow flexibility to redistribute passenger loads between existing services and facilities
Goal 3: Support Economic Development	• Improve accessibility to existing and developing employment centers in the study area • Encourage new businesses to locate near transit stations
Goal 4: Support Transit-Oriented Land Use Patterns within the Study Area	• Support local plans calling for transit-oriented land use patterns and mixed land uses around station areas to improve pedestrian and transit access • Support patterns of transit-oriented development in existing communities • Provide opportunities for increased employment and residences within 1/2-mile of transit stations
Goal 5: Respond to Demands of New Travel Markets in the Study Area	• Provide improvements which respond to changes in population and employment throughout the study area • Provide services to new western stations (Elburn, La Fox) which are competitive with auto travel to these stations • Allow for new services on existing transit lines to respond to demand for suburb-to-suburb trips and reverse-commuting patterns
Goal 6: Ensure Economic Vitality of Freight Operations	• Maintain the ability of the railroads in the study area to support the economic vitality of the region • Minimize conflicts between freight and passenger services on the railroads in the study area
Goal 7: Provide a Cost-Effective Investment	• Provide service and facility improvements which enhance the cost-effectiveness of the existing transit services • Support the extensions and rehabilitations currently being made to fixed guideway services in the study area
Goal 8: Minimize Negative Impacts on the Human and Natural Environment	• Develop facility and service improvements which equitably serve the people they affect • Minimize need for displacements/relocations • Minimize negative impacts to cultural and historic resources • Minimize negative impacts to natural resources • Provide transit solutions which help the region meet federal air quality standards • Minimize negative impacts to traffic and circulation within the study area

The study area goals and objectives were also defined with the intent to remain consistent with the FTA criteria for major capital investment projects. This consistency ensures that the project remains eligible for federal funding under Section 5309, New Starts for Fixed Guideway

Projects, to fund and support major transit capital investment projects. The FTA criteria provide the necessary information to justify the project and allow for comparison with similar projects that are competing for discretionary federal funds.

1.2.4 Evaluation Methodology

The evaluation that occurs in the context of an Alternatives Analysis is a process established by the FTA to:

- Define the Purpose and Need of the study, explaining why the study is being undertaken and what issues it is designed to address;
- Express the Purpose and Need of the study in terms of a set of Goals and Objectives that represent a framework in which alternative courses of action may be measured for their ability to meet the needs of the study;
- Define evaluation criteria that make it possible to compare alternatives against one another based on their ability to meet the goals and objectives of the project; and,
- Use the evaluation criteria to screen out the least-effective alternatives, allowing stakeholders to select an LPA from the remaining alternatives.

The key to such a process is that evaluation criteria are driven by the needs of the corridor. While many of the criteria used to evaluate alternatives for the UP-W Line may be similar (or identical) to those used in other Metra projects or other FTA New Starts projects, their relative importance when ranking alternatives will be determined by the specific needs of the corridor.

The evaluation is an iterative process where an increasingly detailed set of evaluation criteria are applied to a decreasing set of alternatives. As part of this Alternatives Analysis a two-part initial screening was conducted followed by the detailed evaluation that resulted in a recommendation for an LPA (See Document #4: Evaluation Methodology (March 1, 2006) for further information).

- **Initial Screening, Part I.** The purpose of the initial screening was to evaluate the full range of alternatives at a conceptual level, identifying those alternatives with the greatest potential to address the Purpose and Need of the study. At this stage of analysis, the alternatives were only defined in general terms; therefore, it was not possible to evaluate them with great precision. The screening criteria measured the effectiveness of the alternatives in terms of either qualitative assessments or order-of-magnitude quantities.
- **Initial Screening Part II.** Conceptual alternatives were developed for each alternative mode remaining from Part I. These conceptual alternatives were then evaluated to determine their relative ability to increase capacity, reduce travel times, reduce operating costs, minimize capital costs, and minimize negative environmental impacts. At the conclusion of Part II, a reduced set of conceptual alternatives was recommended for further refinement and ultimately, development into detailed alternatives.
- **Detailed Screening.** The purpose of the detailed screening was to provide sufficient information on each alternative to allow local decision makers to select an LPA. Issues raised by the results of the initial screening (costs, operating assumptions, etc.) were examined further and used to define a set of conceptual alternatives prior to beginning the detailed screening. This allowed more detailed assessments of operating assumptions, ridership potential, costs, and environmental impacts. As part of the

detailed screening, the regional travel demand model was used to provide initial estimates of ridership and traffic impacts.

Section 2.0 summarizes the key inputs, outcomes, and decisions made using this methodology.

2.0 Summary of Alternatives Analysis

This section provides a summary of the process used and the results from each step of this Alternatives Analysis. Also included in this section is a summary of the public involvement activities conducted in the same timeframe.

2.1 Definition and Screening of Initial Alternatives, Part I

Under Part I of Initial Screening, a range of modes were screened against basic evaluation criteria, independent of potential alignment options to determine their compatibility with the study area, likely cost, and potential for travel time savings. More detailed information on these modes, the key operating characteristics that were assumed in the evaluation, as well as the specific evaluation results are included in *Document # 5: Initial Alternatives, Part I: Screening and Part II: Conceptual Design* (March 23, 2006).

The modes considered fell within the following four categories:

- Rail Modes. This category included modes that use traditional rail technologies, including commuter rail, intercity rail, high speed rail, heavy rail transit, light rail transit, and streetcar.
- Rubber-tire Modes. This category includes express bus, local bus, and bus rapid transit.
- Other Fixed Guideway Modes. This category included other technologies with transit applications that either do not ride on steel rails or rubber tires were also considered including: Magnetic Levitation, Automated Guideway Transit, and Personal Rapid Transit.
- Highway Modes. Since some transportation needs within the study corridor are related to highway congestion, the initial range of modes considered included highway capacity improvements such as: (1) the addition of general use lanes, (2) the addition of high-occupancy vehicle (HOV) lanes, and (3) use of congestion management tolling.

These modes were evaluated using three criteria, all of which were developed from the goals and objectives stated in the Purpose and Need. According to that document, to address transportation problems in the study area, an alternative must decrease travel time in the system while not exceeding the local financial capacity to build the project. Accordingly, two of the criteria used in the initial screening were travel time savings and cost. The third measure evaluated basic study-area compatibility issues. Each of the criteria were defined so that it would be possible to use readily available information applicable to this study area. The detailed definitions of the three criteria are provided below:

- Cost Order of Magnitude (based on recent U.S. projects)
    - This measure of effectiveness directly related to the ability of a proposed alternative to be constructed within the local financial capacity.
- Travel Time Order of Magnitude (based on U.S. projects)
    - This measure of effectiveness directly related to a key project purpose, to decrease travel time including travel time for the reverse commute.

- Mode compatible with Study Area
    - This measure examined station spacing, capacity of mode compared with demand from previous studies, and compatibility issues (such as winter-weather compatibility).

2.1.1 Initial Screening: Part I Results

A summary of these measures for the modes studied as well as the results of the initial screening are presented in Table 2.1. The modes were reviewed for their compatibility with the study area first. Modes found to be not compatible with the study area were dropped from further study at that point. These modes are shaded gray in the table.

2.1.2 Modes Carried Forward to Part II Conceptual Design and Screening

Three potential modes and technologies were found to meet the needs of the study corridor and performed the best relative to cost and travel time savings:

- Commuter Rail – This mode offers the lowest travel time and can be implemented within the local financial capacity.
- Express Bus – Express Bus has the potential to cost less than Commuter Rail, although travel times in peak hours will be greater than Commuter Rail.
- Bus Rapid Transit – This mode has the potential for comparable travel times to Commuter Rail, but may have capital costs greater than those of Express Bus.

Table 2.1: Summary of Initial Screening, Part I

Mode	Compatibility of Mode with Study Area	Cost and Travel Time Criteria			Results of Initial Screening Part I	
		Range of Unit Costs	Range of Cost	Range of Travel Time	Recommendation	Rationale
Rail						
Commuter Rail	Compatible	$15M to $30M per mile[1]	$384M to $1,300M	1:11 – 1:20	Retain for further evaluation	Comparatively low cost and good travel times
Intercity Rail	Not compatible due to station spacing				Drop from further study	Not compatible with study area needs
High Speed Rail	Not compatible due to station spacing				Drop from further study	Not compatible with study area needs
Heavy Rail Rapid Transit (HRT)	Compatible	$100M to $200M per mile[2]	$4,400M to $8,800M	1:06 – 1:45	Drop from further study	Very high initial cost without improvement in travel times[3]
Light Rail Transit (LRT)	Compatible	$28M to $100M per mile	$1,200M to $4,400M	1:55 – 2:55	Drop from further study	High initial cost with significantly worse travel times[4]
Streetcar	Not compatible due to station spacing and operating speed				Drop from further study	Not compatible with study area needs
Rubber-Tire Modes						
Express Bus	Compatible	$300,000 to $500,000 per vehicle	$3M to $7.5M[5]	Travel times similar to current highway peak hour travel	Retain for further evaluation	More detail required to compare costs, travel times, and study area impacts[6]
Local Bus	Not compatible by itself due to large movement of passengers over great distances				Drop from further study	Not compatible with study area needs although will be part of an overall solution to the study area needs
Bus Rapid Transit "Low End"[7, 8]	Compatible	$1M to $85M per mile plus $1M per vehicle	$40M to $3,720M	1:55 – 2:55	Retain for further evaluation	More detail required to compare costs, travel times, and study area impacts

Mode	Compatibility of Mode with Study Area	Cost and Travel Time Criteria			Results of Initial Screening Part I	
		Range of Unit Costs	Range of Cost	Range of Travel Time	Recommendation	Rationale
Bus Rapid Transit "High End" [7, 8]	Compatible	$1M to $85M per mile plus $1M per vehicle	$40M to $3,720M	1:55 – 2:55	Drop from further study	High initial cost without improvement in travel times
Other Fixed Guideway						
Magnetic Levitation	Not compatible due to station spacing and weather conditions				Drop from further study	Not compatible with study area needs
Automated Guideway Transit	Compatible	$90M to $300M per mile	$3,900M to $13,100M	Varies by specific technology	Drop from further study	Very high initial cost without significant improvement in travel times[9]
Personal Rapid Transit	Not compatible due to need to move large volume of passengers using small vehicles				Drop from further study	Not compatible with study area needs
Highway						
Highway Capacity Improvements	Compatible	$2M to $15M per lane mile	$200M to $1,400M	In peak hours, travel times would be improved over existing conditions.	Drop from further study	High initial cost without improvement in travel times[10]

Notes:

1 High estimate based on North American averages for upgrading a freight rail line for commuter rail service. Low estimate developed by Metra for the March 2003 document, Metra Proposed TEA-21 Reauthorization Initiatives: Creating New Service Opportunities Now and For the Future.

2 The average cost per mile for Rapid Transit assumes mainly at-grade and elevated sections. Below grade sections would raise the cost per mile.

3 HRT would require a new right-of-way as well as grade separation. It would cost 20 to 25 times the cost of Commuter Rail with no savings in travel time.

4 LRT requires a new right-of-way, the cost would be 8 to 15 times the cost of Commuter Rail. Travel time would approximately double.

5 Based on estimated travel times, 10 to 15 vehicles would be required to provide a 15-minute headway for express bus (this includes a 20% spare ratio.) Cost per vehicle does not include maintenance facilities, station improvements, or roadway infrastructure improvements.

6 The cost would vary widely based on whether existing highway infrastructure can be used and the number of vehicles required.

7 BRT is a relatively new technology with a wide spectrum of components. At the "low end," BRT consists of typical local buses running on shoulders and in mixed traffic with very little investment at loading points. At the "high end," BRT has specialty buses, dedicated lanes or guideways, signal priority, and elaborate stations including parking. Some BRT systems even have portions of the route running in dedicated tunnels (greatly escalating the cost per mile). The cost of "high end" BRT assumes dedicated lanes for the entire route and stations with parking.

8 BRT travel times would be 2 to 3 times those of Commuter Rail. The cost of "high end" BRT would be 10 times greater (or more) than Commuter Rail. "High end" BRT should not be studied further. "Low end" BRT has greater travel time but lower cost and could be carried forward for further evaluation.

9 With some AGT technologies, AGT travel times may be comparable with Commuter Rail. However, since the cost would be 20 to 40 times greater (or more), AGT is not recommended for further study

2.2 Definition and Screening of Initial Alternatives, Part II

The Commuter Rail and Bus Rapid Transit (BRT) options were used to develop potential "Build Alternatives" for the UP-W Line Upgrade study. Express Bus was used to develop a Transportation Systems Management (TSM) Alternative, which typically is used along with a No-Build Alternative to provide a basis for comparison. The alternatives were defined at similar levels of detail to ensure a fair evaluation.

The conceptual alternatives are listed below, and defined in detail in *Document 5: Initial Alternatives, Part I: Screening and Part II: Conceptual Design* (March 23, 2006):

- **Alternative 0–No-Build.** The No-Build Alternative represented the existing and committed transportation infrastructure of the study area. It was used as a basis of comparison for all other alternatives.
- **Alternative 1–TSM/Baseline (Express Bus).** The TSM Alternative represented a collection of lower-cost, shorter-term investments aimed at addressing the proposed needs in the corridor. The Express Bus option carried forward from the Part I Screening was developed as the TSM Alternative.
- **Alternative 2–Commuter Rail Improvements to the UP-W.** This alternative included a range of investment options for the UP-W commuter rail line. Potential improvements include changes in the track configuration, signal system upgrades, increases in parking capacity and feeder bus service, and service adjustments.
- **Alternative 3–Commuter Rail Improvements to the BNSF.** This alternative consisted of improvements to the BNSF commuter rail line. Improvements included increases in storage capacity, track configuration enhancements, changes in train lengths, and signal system upgrades.
- **Alternative 4–Bus Rapid Transit.** This alternative consisted of BRT service aimed at providing a time-competitive transit alternative to commuter rail. Under this alternative, BRT service would be provided between Elburn and downtown Chicago, primarily using new high-occupancy vehicle lanes along I-290 and I-88. The alternative would use a dedicated fleet of vehicles, rail-like stations, and off-board fare collection. Transit signal priority would be provided where appropriate.

The Part II screening was designed to determine which Build Alternatives should be carried forward to detailed screening and document the assumptions, benefits, and impacts of the conceptual alternatives.

Five screening measures were used in the Part II screening:

- Capacity—degree to which each alternative provides an increase in capacity.
- Travel Time—degree to which each alternative provides a decrease in travel time.
- Operating Cost—Degree to which each alternative minimizes operating costs.
- Capital Cost—Degree to which each alternative minimizes capital costs.
- Environmental Impacts—Degree to which each alternative minimizes negative environmental impacts.

Each alternative was evaluated against each criterion using the same, three-tiered scoring system:

- **+** The alternative may provide major benefits or avoid major adverse impacts.
- O The alternative may provide incremental benefits or create minor adverse impacts.
- – The alternative provides no benefit or may lead to major adverse impacts.

The individual criterion scores were not intended to be combined into a composite score for each alternative; they were only designed to provide order-of-magnitude comparisons between the alternatives and to highlight those alternatives that meet the goals and objectives of the study while minimizing negative impacts.

2.2.1 Initial Screening: Part II Results

Table 2.2 includes a summary of the performance of the conceptual alternatives against the screening criteria listed above.

Table 2.2: Summary of Initial Screening Part II

Alternative	Criteria					Recommendation
	Increase in Capacity	Decrease in Travel Time	Decrease in Operating Costs	Minimizes Capital Costs	Minimizes Negative Env. Impacts	
Alternative 0: No-Build	–	–	–	+	O	Retain for further study
Alternative 1: TSM/Baseline	O	–	–	O	+	Retain for further study
Alternative 2a: UP-W Full	+	+	+	–	+	Retain for further study
Alternative 2b: UP-W Moderate Option 1	+	O	O	–	+	Retain for further study
Alternative 2c: UP-W Moderate Option 2	+	+	+	O	+	Retain for further study
Alternative 2d: UP-W Minimum	O	O	O	–	+	Retain for further study
Alternative 3: BNSF	O	O	O	–	O	Remove from further consideration
Alternative 4: Bus Rapid Transit	O	O	–	–	+	Remove from further consideration

Notes:

+ May provide major benefits or avoid major adverse impacts.

O May provide incremental benefits or create minor adverse impacts.

– Provides no benefit or may lead to major adverse impacts.

Alternative 1 was initially retained for further study; however, upon further discussion with FTA and some additional assessments of its likely performance, it was determined that the TSM alternative would be unlikely to perform significantly better than the No-Build alternative; furthermore, it appeared unlikely that a bus-based TSM alternative would be able to offer travel times comparable to the existing commuter rail service in the corridor.

Alternative 3 was not recommended for further study because the proposed improvements could not be accommodated within the existing right-of-way, and would impose major impacts on the environmental resources and adjoining land uses along the BNSF. The proposed improvements would also be very costly, but would only result in incremental travel time and capacity enhancements.

Alternative 4 was not recommended for further study because the travel time and capacity benefits of the alternative are dependent upon the ability to provide dedicated travel lanes for the BRT vehicles along the full length of the corridor. These lanes would be costly and their implementation could conflict with other planned improvements along I-88 and I-290.

2.2.2 Alternatives Carried Forward to Detailed Definition and Screening

Two alternatives were recommended for further development and evaluation, as follows:

- **Alternative 0–No-Build.** This alternative is required for comparative purposes.
- **Alternative 2–Commuter Rail Improvements to the UP-W.** Alternative 2 offers an opportunity to leverage the region's existing investment in commuter rail by providing improvements to optimize services along the UP-W line. Several combinations of improvements were considered during the screening to assess the performance of differing combinations of improvements (e.g., a third track versus relocation of the A-2 interlocking). Based on the outcome of the analysis, it was determined that the following combinations of improvements should be carried forward: 2a (UP-West Full), 2b (UP-West Moderate Option 1), and 2c (UP-West Moderate Option 2). Alternative 2d (Up-West Minimum) was eliminated from further consideration because the minor improvements would not increase service sufficiently on the existing railroad.

2.3 Definition of Feasible Alternatives

The feasible alternatives remaining after Initial Screening: Part II were defined in greater detail to allow for preliminary estimates of their ridership and costs. These alternatives are listed below, and defined in detail in *Document 7: Feasible Alternatives* (June 16, 2007):

- **Alternative 0: No-Build**. The No-Build Alternative, as required by the National Environmental Policy Act of 1969 (NEPA), provides a baseline against which the proposed project is compared. The No-Build Alternative reflects a scenario in which nothing beyond already programmed projects is done to improve transportation infrastructure and services in the study area. The alternative is intended to demonstrate whether the planned transportation system can sufficiently meet study area needs without the proposed project. No major changes to the UP-W Line are expected as part of the No-Build Alternative. However, the No-Build Alternative also includes:
    - Existing transportation infrastructure in the region; and,
    - Projects for which funding has been committed;

For the UP-W Line Upgrade study, the existing network and planned projects include roadways, rail facilities and services, and other transit facilities and services. Committed improvements are documented in the *Chicago Metropolitan Agency for Planning Transportation Improvement Program (TIP) for Northeastern Illinois, FY 2007-2012*, which identifies major capital improvements that have committed funding sources. These projects are also elements of the *2030 Regional Transportation Plan (RTP) for Northeastern Illinois* (October 2003) Both the RTP and the TIP are developed and updated by the Chicago Metropolitan Agency for Planning (CMAP)—the metropolitan planning organization for northeastern Illinois—in coordination with local jurisdictions.

- **Alternative 2a: Commuter Rail Improvements to the UP-W**. Alternative 2a includes a range of improvement options for the UP-W commuter rail line, reflecting a moderate-to-high level of investment in the existing line:
    - Add a third mainline track between the Elmhurst and River Forest stations to allow zoned express service through this area.
    - Add crossovers between the Elmhurst and West Chicago stations to facilitate passing train movements.
    - Upgrade signal systems from two-aspect to four-aspect between Ogilvie Transportation Center (OTC) and Geneva Station, allowing trains to operate on closer headways.
    - Relocate the A-2 (Western Avenue) interlocking about one mile to the east to a new location designated A-1 to improve the capacity and operating speeds of the rail lines at this location.
    - Increase station parking capacity and feeder bus service to stations to meet forecast passenger demand.
    - Adjust service along the UP-W Line (including the extension to Elburn) to make use of the new capacity provided by the track and signal upgrades.
    - Increase the rail rolling stock fleet, if necessary, to support increased service.
- **Alternative 2b: Commuter Rail Improvements to the UP-W, Moderate, Option 1**. This alternative reflects a more moderate level of investment in the UP-W Line and would result in a medium capacity increase for the line. The alternative includes all potential upgrade elements listed above for Alternative 2a, except for the proposed relocation of the A-2 interlocking.
- **Alternative 2c: Commuter Rail Improvements to the UP-W, Moderate, Option 2**. This alternative also reflects a moderate level of investment in the UP-W Line, resulting in a modest decrease in travel times. The alternative includes relocation of the A-2 interlocking, and increases in parking and bus service at stations. The alternative does not include the addition of the third track, crossovers, or signal upgrades.

2.4 Detailed/Final Screening

The purpose of the detailed screening was to provide sufficient information on each alternative to allow local decision makers to select an LPA. As described above in Section 2.3, each of the alternatives carried forward from Initial Screening was refined to allow more detailed assessments of their operating assumptions, ridership potential, costs, and environmental

impacts. As part of the detailed screening, the regional travel demand model was used to provide initial estimates of ridership and transportation benefits and effects.

The detailed screening process included several of the FTA's New Starts criteria to ensure that local decision makers are able to defend their selection of an LPA to the FTA using the same measures the FTA uses when selecting projects eligible for funding for Preliminary Engineering (PE), Final Design, and construction.

The detailed screening criteria, analysis, and results are presented in *Document #8: Final Screening Results* (June 14, 2007).

2.4.1 Detailed Screening Results

Table 2.3 provides a summary of the performance of each alternative versus the evaluation criteria. Quantitative data is shown for each criterion when possible, otherwise performance under each criterion is categorized as being generally positive (**+**), generally negative/adverse (**-**), or having negligible effects on the study area (**O**).

Table 2.3: Summary of Detailed Screening Results

Goal	Detailed Screening Criteria	Alt. 0 – No-Build	Alternative 2 – Commuter Rail Improvements to UP-W[1]		
			Alt 2a Full Build	Alt. 2b No A-2 Interlocking	Alt. 2c No 3rd Main Line
Goal 1: Improve Mobility	Population within ½-mile of transit stations	106,897	106,897	106,897	106,897
	Increase in regional transit ridership[2]	N/A	3,411	2,551	889
	Peak period, peak direction passenger capacity provided in the study corridor[3]	59 Trains 13,704 Seats	74 Trains 16,509 Seats	74 Trains 16,509 Seats	59 Trains 13,704 Seats
	Travel times between Elburn and OTC (min.)[4]	72	65	66	71
	Travel Times between Elmhurst and OTC (min.)[4]	26	20	21	25
	Travel Times between Elburn and Elmhurst[4]	46	48	48	46
	Normalized travel time savings (seconds of Transportation System User Benefit per Project Passenger Mile)	N/A	34.20	26.68	9.12
Goal 2: Improve Reliability of Existing Service	Effect of service, facility improvements on on-time performance of new and existing services	O	+	+	+
	Assessment of operational flexibility of existing transit lines under each alternative	O	+	+	O
	Peak hour passenger capacity of transit services operating between existing stations	O	+	+	O
Goal 3: Support Economic Development	Employment within ½-mile of transit stations	+	+	+	+
	Documentation of successful redevelopment efforts around existing stations in the corridor	+	+	+	+
	Presence of station area plans and economic incentives for introducing new businesses to transit stations	O	O	O	O
Goal 4: Support Transit-Oriented Land Use Patterns within the Study Corridor	Documentation of enforceable growth management plans	O	O	O	O
	Consistency with local zoning	+	+	+	+
	Documentation of transit-oriented development plans which would be supported by the proposed alternative	O	+	+	O
	Documentation of existing land use	+	+	+	+

Goal	Detailed Screening Criteria	Alt. 0 – No-Build	Alternative 2 – Commuter Rail Improvements to UP-W[1]		
			Alt 2a Full Build	Alt. 2b No A-2 Interlocking	Alt. 2c No 3rd Main Line
Goal 5: Respond to Demands of New Travel Markets in the Corridor	Projected change in population, employment within ½-mile of stations compared to projected change in population, employment within study area between the years 2000 and 2030	O	+	+	+
	Difference in Transit and Auto Travel Times from Elburn to Chicago CBD [5]	-49 min	-59 min	-58 min	-50 min
	Difference in Transit and Auto Travel Times from Geneva to Chicago CBD[5]	-34 min	-43 min	-42 min	-35 min
	Passenger capacity provided for non-CBD oriented trips (peak hour, both directions)	59 Trains 16,742 Seats	74 Trains 18,260 Seats	74 Trains 18,260 Seats	59 Trains 16,742 Seats
Goal 6: Ensure Econ Vitality of Freight Ops	Assessment of railroad freight and passenger capacities and conflicts, based on discussions with railroad owners and operators	O	+	+	O
Goal 7: Provide a Cost-Effective Investment	Refined capital costs[6]	N/A	$441.6	$305.4	$136.2
	Increase in annual O&M costs (millions of dollars) [7]	0	$8.3	$8.3	0
	Incremental cost per hour of Transportation System User Benefit (in 2006 dollars)	N/A	$19.04	$18.57	$20.65
	System operating cost per passenger mile	$2.78	$2.35	$2.36	$2.77
	Impact of proposed alternative on effectiveness of committed projects in the region	O	O	O	O
Goal 8: Minimize Negative Impacts on the Human and Natural Environment	Number of low-income households within ½-mile of transit stations	3,126	3,126	3,126	3,126
	Number of low-income households adversely affected	None	None	None	None
	Number of businesses adversely affected	None	29 parcels 4 with active business	None	29 parcels 4 with active business
	Number of residences adversely affected	None	none	none	none
	Number of historic and cultural resources affected	O	O	O	O
	Natural resources affected	O	O	O	O

Goal	Detailed Screening Criteria	Alt. 0 – No-Build	Alternative 2 – Commuter Rail Improvements to UP-W[1]		
			Alt 2a Full Build	Alt. 2b No A-2 Interlocking	Alt. 2c No 3rd Main Line
Goal 8 Continued	Number of vehicle miles traveled (VMT) in the region in the year 2030	O	O	O	O
	Change in regional pollutant emissions (CO, NO_X, PM-10, VOC) generated	O	O	O	O
	Level of Service (LOS) analysis of key road segments, intersections, and interchanges in the study area	O	O	O	O

Notes:

1 + Comparatively Better O Neither Better nor Worse – Comparatively Worse

2 Ridership reflects change in transit person trips (Build –No-Build), 2030 Daily. (March 2007 model forecasts)

3 Passenger capacity reflects the entire number of seats provided on all trains arriving at Ogilvie Transportation Center between 7:00 a.m. and 8:59 a.m.

4 Minimum travel time, based on assumption of 2 minute travel time savings due to A-2 relocation and 1 minute travel time savings from signal improvements for express trains

5 Difference between 2030 transit and auto travel times in minutes

6 Estimated capital costs expressed in 2006 dollars

7 Estimated O&M costs in constant 2005 dollars. No adjustments were made for inflation

2.4.2 Recommendation of an LPA

Table 2.4 summarizes the key indicators that will determine the New Starts competitiveness of the preferred LPA and the other Build Alternatives studied. As demonstrated by the estimates of user benefits and weekday ridership, the benefits of Alternatives 2b and 2c are complementary; therefore, Alternative 2a demonstrates the greatest ridership and benefits, benefiting from all of the proposed improvements. The additional benefits from Alternative 2a are sufficient to offset the additional cost of providing all of the proposed improvements, resulting a New Starts rating of Medium. This is the same rating as Alternative 2b and is competitive with other New Starts across the United States.

Table 2.4: Key Indicators for Build Alternatives

	Alternative 2a - Full Alternative	Alternative 2b - Moderate Option 1	Alternative 2c - Moderate Option 2
Average Weekday User Benefit (hrs)	7,776	6,044	1,734
Average Weekday New Riders	3,411	2,551	889
Annual User Benefits (hrs)	2,069,997	1,608,805	461,545
Annualized Capital Costs ($2006)	$30,908,693	$21,376,423	$9,532,270
Incremental Annual Operating Costs ($2005)	$8,278,590	$8,278,590	$0
CEI ($2006) [1]	$19.04	$18.57	$20.65
New Starts Rating	Medium	Medium	Medium

1. CEI estimated using Annual Operating Cost of $8.5 M (O&M numbers updated after CEI calculation made.) Numbers in this table were used for screening alternatives and refined as part of the definition of the LPA.

Based on the performance of Alternative 2a relative to the screening criteria, it is recommended that Alternative 2a be advanced as the Locally Preferred Alternative. The effects of the new third mainline, the signal improvements, and the improvements at A-2 are additive, each contributing distinct advantages to the travel times and frequency of service possible on the UP-W Line. Because Alternative 2a includes all of these improvements, it would result in the best overall performance in terms of mobility improvements, reliability of service, passenger capacity, service frequency, and transit ridership in the study area. In turn, Alternative 2a costs more than either Alternatives 2b and 2c. However it is important to note that because Alternative 2a provides more benefits than Alternatives 2b or 2c could provide alone, its cost effectiveness index (CEI) is only slightly higher than Alternative 2b and is actually slightly lower than Alternative 2c.

Alternative 2a has the highest ridership of the three alternatives, benefiting from both the increased service and travel time savings made possible by implementing all of the improvements under consideration for the UP-W Line. Alternative 2c has approximately one third of the ridership of Alternative 2b, indicating that the improvements in service frequency and capacity made possible by the third mainline and signal improvements have a greater impact on overall ridership than the A-2 interlocking.

Alternatives 2a and 2c would result in far better on-time performance than Alternative 2b; with the relocation of the A-2 interlocking estimated to decrease the total delay of revenue and non-revenue trains by 267 minutes. Alternatives 2a and 2b would both offer additional operational flexibility compared to Alternative 2c, a result of the third mainline track, intermediate crossovers, and signal improvements. Alternatives 2a and 2b would also improve the overall capacity on the UP-W Line compared to Alternative 2c. Furthermore, Alternatives 2a and 2b would best support the economic vitality of freight operations by reducing the number of conflicts between passenger and freight traffic as a result of signal upgrades and the third mainline.

Because each of the Build Alternatives is being constructed predominantly in existing rights of way and within an urbanized area, adverse effects to the natural, built, and cultural environment are negligible. All of the alternatives were found to be supportive of economic development and transit-oriented development and responsive to demands of new travel markets.

3.0 Public Involvement Summary

3.1 Summary of Meetings

Throughout the study process, Metra has held meetings with individual stakeholders and with the general public to obtain input and gain consensus regarding the improvements to be implemented. Meetings held to date have included the following:

- Kane County Council of Mayors (May 24, 2005)
- DuPage Mayors & Managers Conference (April 26, 2005)
- North Central Council of Mayors (May 26, 2005)
- West Central Municipal Conference (April 19, 2006)
- Pace Coordination Meetings (March 6, 2006, July 17, 2006, and October 18, 2006)
- Chicago Transit Authority Coordination Meeting (July 18, 2006)
- Union Pacific Coordination Meetings (September 28, 2005 and August 9, 2006)
- Prairie Stone, FTA, Business Leaders Presentation & Tour (June 27, 2006)
- West Chicago Business Outreach (August 29, 2006)
- Northwest Municipal Conference Meeting (NWMC) (May 9, 2007)
- Technical Advisory Committee (February 24, 2006, May 10, 2006, and June 20, 2007)
- Public Meetings (June 13 and 14, 2006; July 10 and 11, 2007)

Following each meeting, the comments received have been evaluated and incorporated into the study where appropriate. In addition, the Metra Connects website provides a method for anyone to comment on the Study, up to date information on the study, including public meeting presentation materials (http://metraconnects.metrarail.com/upw.php).

3.2 Public, Agency, and Stakeholder Comments

Following publication of *Document 8: Final Screening Results*, Metra convened the Technical Advisory Committee (TAC) and held public workshops to obtain input on the recommended Locally Preferred Alternative (LPA). Overall, TAC and public comments were positive and in favor of the recommended LPA.

The TAC was held on June 20, 2007 at Elmhurst City Hall. The Alternatives Analysis process, comments received to date, detailed screening results, recommended LPA, project schedule and next steps were described to TAC members in attendance. Most of the discussion at the meeting centered around assumptions made in conducting the analysis, including: how bus connections were evaluated, how parking was considered, whether the study included an analysis of rail traffic, the number of train sets being proposed for the LPA, what types of roadway improvements would be included, and what projects were considered as part of the No-Build Alternative. In addition, TAC members also requested details about the format of the public meetings and how the public would be notified of the meetings. The study team was able to answer all questions to the satisfaction of the TAC members and there were no outstanding issues or questions.

Public comments received about the recommended LPA were positive. Commenters noted that the UP-W alternatives were preferable to the bus alternatives, as they provided more direct routing and were perceived as having less of a negative impact on traffic. Several written comments expressed support for the full-build option, due to anticipated improvements in speed and reliability of service to and from Chicago. Commenters stated that the proposed A-2 relocation and the addition of the third mainline track would reduce conflicts between freight trains and commuter rail service, thus improving the commute for Metra's UP-W passengers and providing regional benefits. One commenter noted that improvements to rail transportation were of the highest importance, stating that if the full-build option became too expensive, Metra should pursue the other UP-W options. Several other commenters requested that Metra move forward with the recommended improvements as quickly as possible and ensure that the upgrades are implemented. Commenters also asked that Metra continue to inform and involve the local community.

Multiple comments addressed the need for specific infrastructure along the line such as the addition of grade crossings for vehicles or pedestrians; the locations of crossovers; and the possibility of an extension west from Elburn. Metra noted that grade separations, extensions, and new stations were not being considered as part of this study, but new crossover locations were being coordinated with Union Pacific.

Many of the verbal and written comments received were questions about the train schedule and travel times. Metra responded that travel times would be improved throughout the day, and that the frequency of service was anticipated to increase during the morning and evening peaks on weekdays.

Specific comments were directed at the possibility of adding a new station at Ashland and combining the stations at Bellwood and Melrose Park. Metra responded that these proposals will not be precluded by the proposed upgrades to the UP-W.

Other comments concerned north-south mobility in DuPage County and transit-oriented development around stations. Metra responded that, while north-south connecting services are important to the study, the primary focus is on east-west mobility in the study area and that new development at stations is controlled by local jurisdictions.

Several other questions focused on project elements (such as hybrid technology and communications equipment to provide train status) and the project development and evaluation process (such as when construction would be complete; how the cost-benefits analysis for the study was completed; how many alternatives were studied for the project.) In turn, Metra noted that specific technologies for power and communications will be selected during future phases of the study and that improved passenger communications at Metra stations are currently under study. Metra also explained the study schedule and process including the cost-benefit analysis.

4.0 Locally Preferred Alternative

This section provides a full description of the Locally Preferred Alternative, incorporating the latest feedback from the Technical Advisory Committee and the general public. The description also takes into account further review and refinement of the LPA performed after the detailed screening of alternatives.

4.1 General Description

To respond to increasing demand for both passenger and freight services, Metra is proposing to implement capacity-related transit improvements along the UP-W Line to relieve congestion and improve mobility on the existing transportation network; meet the mobility needs of the growing activity centers in the study area; meet the needs of non-traditional travel markets (e.g. reverse-commutes, suburb-to-suburb trips); and maintain the competitive advantage of the study area as an economic engine and international freight and passenger transportation hub. In fulfilling these purposes, the recommended LPA would address the following needs in the study area:

- Relieve pressures put on the existing transportation network by the growth of activity centers.
- Encourage transit-supportive patterns of development that are more easily sustained.
- Respond to the growth in the demand for midday, intermediate, and reverse-commute trips.
- Improve regional transportation capacity while minimizing negative impacts to the natural and built environment.
- Ensure Chicago retains its role as an international freight and passenger transportation hub.
- Help the region meet the National Ambient Air Quality Standards (NAAQS) established by the EPA.

4.2 Infrastructure

The infrastructure improvements associated with the recommended LPA include: relocation of the A-2 interlocking; the addition of the third mainline track; the addition of crossovers; minor modifications to stations to facilitate the third mainline track; and, additional parking at some stations. These improvements are described further below.

4.2.1 Relocation of A-2 Interlocking

The A-2 interlocking is a strategic facility in the Metra system, the point where the UP-W intersects the MD-W, MD-N, and NCS lines. It is also located adjacent to the California Coach Yard (California Yard), where trains from OTC are stored and maintained, and adjacent to the Western Avenue Coach Yard where trains from Chicago Union Station are stored and maintained. On an average weekday, the A-2 interlocking affects 308 Metra trains, 16 Amtrak trains, and approximately 60 percent of Metra's current ridership. The current configuration of A-2 requires UP-W trains to slow to 30 mph, while MD-W, MD-N, NCS, and Amtrak trains must slow to 20 mph. Based on a previous analysis performed by Metra, the current configuration

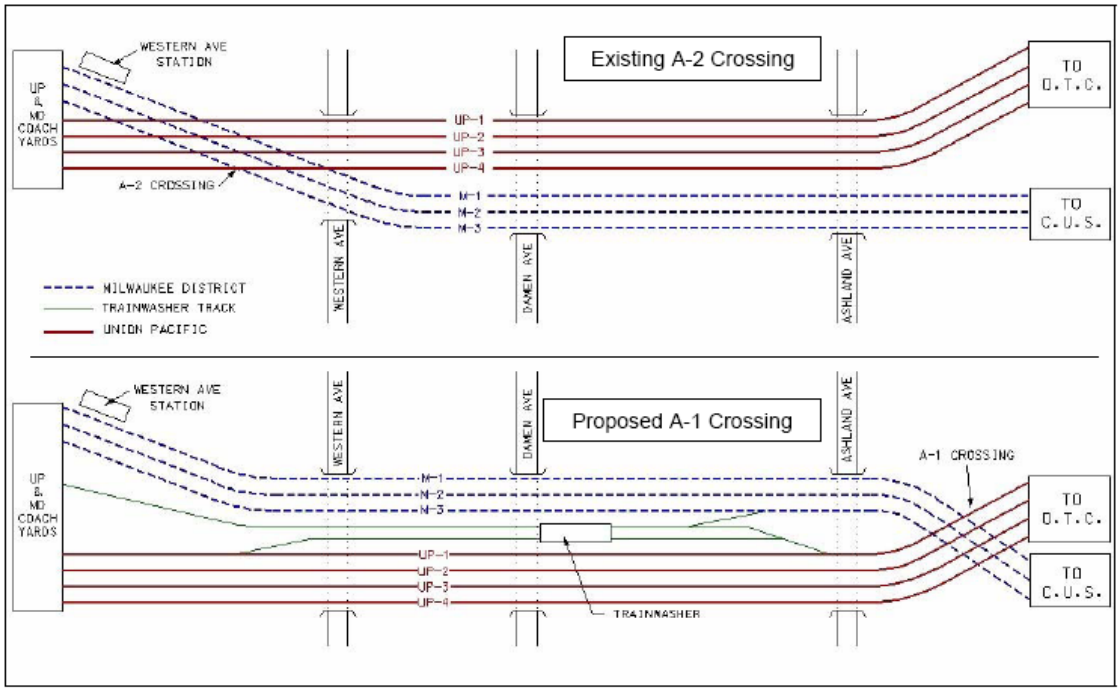
results in an estimated 353 minutes of delay, 25% of which are associated with revenue train operations.

As part of the recommended LPA, the existing interlocking would be relocated approximately one mile east to a new location known as A-1. Work would include a less restrictive alignment and elimination of double-slip switches and moveable point crossings. The new configuration will permit an increase in the maximum operating speeds along the tracks associated with the UP-W and other routes passing through A-2. Schematic drawings of the existing and proposed configurations of A-2 are illustrated in Figure 4.1.

It is estimated that the new configuration will result in two minutes' of travel time savings for all UP-W trains operating between Kedzie and OTC. The new configuration will also provide comparable travel time savings for those trains on the MD-N, MD-W, and NCS operating between Western Avenue and Chicago Union Station.

The new configuration will also improve the operational flow of trains entering and departing the nearby California and Western Avenue Coach Yards. Under the current configuration of A-2, there are limited windows of time through which deadhead movements between OTC and the California Yard may be made. The new configuration will make it possible to increase the number of trains that can operate through the interlocking in each window, thereby improving the efficiency of deadhead movements and providing greater flexibility in scheduling maintenance at the California Yard.

Figure 4.1: Proposed Improvements to A-2 Interlocking
Source: Metra (Rail)



Existing and Proposed Track and Crossing Configurations (Not to Scale)

4.2.2 Addition of Third Mainline Track

The addition of a third mainline track will make it possible for Metra to operate zoned express services that bypass the slower-moving local trains, improving travel times between OTC and the western suburbs. The addition of a third mainline will include the following improvements:

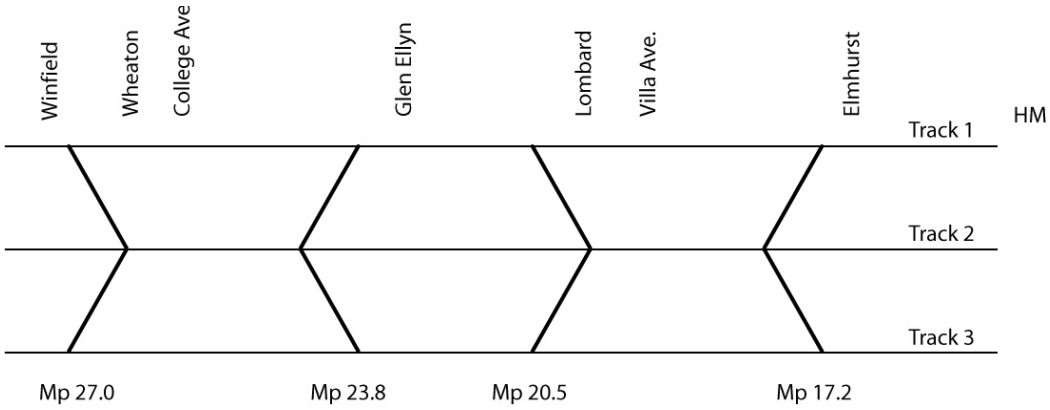
- Potential relocation of station buildings and reconstruction of station platforms at Bellwood, Berkeley, Maywood and Melrose Park stations.
- New crossovers to facilitate train movements past the Proviso Yard and the four stations along the third main line;
- A new span across Addison Creek to accommodate the new third main line track and shifts of the two existing main line tracks;
- A new third mainline track across the existing bridge over the Des Plaines River;
- Realignment of some portions of the existing two mainline tracks to accommodate the third main line;
- Provision of an embankment in the vicinity of an existing detention pond to accommodate the third mainline track; and,
- Modification of street crossings and associated traffic signals at Wolf Road and 1st, 4th, 5th, 9th, 19th, and 25th Avenues to accommodate the third mainline track.

4.2.3 Addition of Crossovers

While there is an existing third main line between Elmhurst and West Chicago, the absence of crossovers along this length limits flexibility and prohibits the development of new zoned express services along this section of the line. By introducing new high-speed crossovers, it will be possible to develop new service patterns and respond to changing demand for suburb-to-suburb service along the UP-W Line.

Two sets of universal crossovers are proposed as part of this improvement: one set between Winfield and Glen Ellyn and one between Glen Ellyn and Elmhurst. A schematic layout of these crossovers is shown in Figure 4.2.

Figure 4.2: Proposed Location of New Crossovers



4.2.4 Stations

While no new stations will be added as part of the recommended LPA, the existing station facilities at Berkeley, Bellwood, Maywood and Melrose Park will need to be reconfigured in order to accommodate the proposed third main line track. As part of this effort, pedestrian and bicycle access to the stations from the adjoining communities will be maintained.

It should be noted that there are local discussions about combining the stations at Bellwood and Melrose Park at a new location. Plans and funding for this effort have not been finalized; however, the proposed improvements to the UP-W Line would not preclude this effort.

As the majority of the station areas along the UP-W Line developed around the stations in traditional, pedestrian-friendly forms of development, existing pedestrian and bicycle connections to the stations are adequate, and will not be improved as part of the recommended LPA. Metra will review and upgrade existing parking and station amenities (such as warming shelters) based upon any increase in commuters as shown in the ridership model.

It is noted that the CTA has proposed adding a station along the Circle Line at Ashland to serve the Illinois Medical Center in the vicinity of A-2. While there are benefits to improving transit access in this area, the addition of a Metra station to interface with the Circle Line at this location would complicate train movements at A-2 and may negate the benefits of this alternative. As CTA develops its Circle Line Project, Metra will work with them in coordinating the benefits of both projects.

4.2.5 Parking

Because the existing parking lots associated with the UP-W Line are already at or near capacity, additional parking would be required at UP-W stations to accommodate the growth in ridership associated with the recommended LPA. The detailed ridership model results for the recommended LPA show where the additional parking demand occurs (See Table 4.1).

Table 4.1: Parking Demand by Fair Zone Pair

Fare Zone Pairs	Stations Included in Fare Zone Pair	Existing Parking Spaces	Total Proposed Parking Spaces	Modeled Parking Demand
GHI	Geneva-Elburn	1,951	3,423	3,535
EF	Glen Ellyn-W. Chicago	2,481	4,139	5,282
CD	Maywood-Lombard	2,668	3,019	3,567
AB	Kedzie-River Forest	341	430	941
	Total	7,441	11,011	13,325

The stations most likely to receive additional parking include: Elburn, La Fox, Winfield, Wheaton, and Villa Park. Additional parking capacity may be constructed; alternatively, it may be leased from local municipalities or private owners. The types of parking (i.e., lots, structure, shared existing lots), locations, and number of spaces to be added at each station will be developed in consultation with local jurisdictions and land owners as the project proceeds through preliminary engineering and the environmental review process.

4.2.6 Yard Changes

It is assumed that any additional maintenance demand placed on the Metra system by the operating plan will be accommodated by adjusting current practices such that midday maintenance activities may occur at the existing yard at Elburn. As a result of this change, it will not be necessary to increase yard capacity to accommodate the operating plan for the recommended LPA.

4.2.7 Terminal Changes

It is assumed that the proposed operating plan may be accommodated with the existing facilities at OTC; therefore, no improvements or modifications to this facility are proposed as part of the recommended LPA.

4.3 Operations

The proposed operating plan calls for a 74-train schedule for the UP-W, requiring a total of 17 train sets. In the morning peak, this would represent six additional eastbound trains, providing both traditional suburb-to-CBD service as well as intermediate trips for suburban commuters reaching suburban work destinations in DuPage and Cook Counties. In addition, service on an existing westbound AM peak train would be extended to provide additional reverse-commute service to stations between OTC and West Chicago. 17 inbound trains and five outbound trains would serve the morning peak; six more inbound and two more outbound trains than provided under the No-Build.

To maximize the effectiveness of the recommended LPA and extend its benefits throughout the study area, the existing bus services connecting to the UP-W Line were assessed to ensure that the majority of major activity centers in the study area would have adequate connections to the new service being provided. As a result of this analysis, it was determined that the majority of activity centers are already connected to the UP-W Line via existing and planned services provided by Pace and the CTA. It is likely that the growing population and employment centers

surrounding Elburn and La Fox will eventually need new connecting services. Metra has been coordinating with Pace regarding these connections. Pace has indicated that they will be undertaking a restructuring of their route network in 2007. Metra will continue to coordinate with Pace to ensure proper connections between Pace services and the services of the recommended LPA.

It should also be noted that the CTA has recommended improving connections between Metra services and the Illinois Medical Center, which is not served by the UP-W. Metra will coordinate with the CTA on this issue as the CTA study progresses.

4.3.1 Travel Time Savings

The infrastructure changes proposed under Alternative 2a would improve travel times for UP-W trains. All trains operating between the A-2 interlocking and Kedzie would gain two minutes of travel time savings, while express trains between Elmhurst and OTC would gain an additional minute of travel time savings.

The operating plan assumes that the hours of operation for the UP-W Line would remain the same as under the No-Build Alternative and that the current time restrictions for freight operations noted in the UP *Operations Profile for the Geneva Subdivision* will remain unchanged.

4.4 Rolling Stock Requirements

In order to accommodate the proposed operating plan under the recommended LPA, it will be necessary to acquire an additional six train sets (five for revenue service, one spare.) The number of locomotives and gallery cars required for the 74-train schedule depends on four inputs:

Seating standards. Recognizing that Metra passengers travel longer distances than passengers on other modes of transit, Metra's 2006 *Fleet Management Plan* establishes a goal of providing one seat for every passenger. It is assumed that this standard will be maintained under all alternatives.

Vehicle passenger capacities. There are two types of gallery cars in operation on the UP-W: coaches and cab cars. Coaches provide a total of 138 seats, while cab cars provide 134 seats. It is assumed that these standards will be maintained under all alternatives.

Peak hour travel demand. The travel demand model used to forecast ridership for each alternative will determine the number of seats required to meet anticipated levels of demand.

Spare ratios. As established in Metra's 2006 *Fleet Management Plan*, the UP-W operates at an 18% spare ratio for locomotives and 4.3% spare ratio for gallery cars. The plan is under review, therefore, these ratios are subject to change.

Based on these inputs, it is estimated that the 74-train schedule will require an additional six locomotives, six cab cars, and 18 coach cars—five locomotives and 22 cars for operations and one locomotive, one gallery car, and one coach car spare. Estimates of rolling stock requirements will be refined as the study continues through the preliminary engineering and environmental review phase.

4.5 Signals and Communication

The UP-W Line has a multiple-aspect wayside signal system, but provides only two cab signal aspects:

1. Clear;
2. Restricting (reduce speed to below 18 mph).

Because of this, a train receiving a wayside signal indication of “Approach” (reduce speed immediately and be prepared to stop at the next signal) must immediately reduce to18 mph and can not return to its maximum authorized speed until the cab signal returns to Clear. On a line with numerous trains making frequent stops, this has a significant detrimental effect on capacity. As the blocks (spaces between signals) on the UP-W Line are unusually long (two to four miles), this arrangement is particularly limiting and inhibits flexibility.

In order to increase the capacity necessary to operate additional Metra trains on the UP-W Line at a reasonable cost, it will be essential to upgrade the existing signal system. As part of this upgrade, an intermediate cab signal aspect would be added to locomotive and cab car equipment, permitting an intermediate reduction to 40 mph. The track circuit would be coded to give this indication approximately midway between the existing block signals. As a result, trains following other trains would be able to operate closer together and incur fewer, less restrictive reductions in speed. They would be able to operate at higher average speeds, and this would increase the overall capacity of the line for Metra operations.

As part of the signal upgrade, all Metra trains operating on the UP-W would be equipped with the necessary signal appliances to take advantage of the operating speeds possible under the proposed signal upgrade. Metra is in discussion with the UP to ensure that the signal upgrade will be designed and implemented in such a way as to avoid negative impacts to UP freight operations.

5.0 Projected Implementation Schedule

The projected implementation schedule is shown below in Table 5.1. Next steps are described in further detail in Section 8.0.

Table 5.1: Projected Implementation Schedule

Key Tasks	Target Date
Public Meeting #2	July 10 & 11 2007
CMAP/CATS Endorsement	June/July 2007
FTA Submittal	September 2007
Environmental Assessment	Starting 2007
Preliminary Engineering	Starting 2008
Final Design	Starting Q1 2009
Construction	Starting Q3 2009
Implementation of New Service	Starting 2011

6.0 Cost Estimates

6.1 Capital Costs

The capital cost estimate for the recommended LPA is shown in Table 6.1. These estimates have been refined in response to further refinements of the travel demand model made since the detailed screening of alternatives was completed. Capital estimates were also revised based upon further input from Metra Engineering, the Union Pacific, and members of the Executive Steering Committee.

Table 6.1: Capital Cost Estimate – Recommended LPA

Description	Capital Costs 2007$)
Third Mainline	$90.8 M
A-2 Crossing	$160.6 M
Signal Costs	$106.6 M
Add Universal Crossovers	$27.0 M
Rolling Stock	$71.4 M
Station Improvements and Parking	$34.8 M
Total	**$491.2 M**

6.2 Operating Costs

The refined projected increase in the annual operating and maintenance costs as a result of the recommended LPA is $7.6 million in 2007 dollars. This amount may decrease due to improvements in deadhead movements associated with the A-2 interlocking. Additional operational analysis will be performed in Preliminary Engineering to refine this estimate.

7.0 Projected Ridership

Projected ridership and the transportation system user benefits for the recommended LPA are presented below.

7.1 Ridership Projections

The LPA is anticipated to generate an additional 2,901 daily boardings over the No-Build Alternative. The projected ridership for the recommended LPA is shown below in Table 7.1.

Table 7.1: Projected Ridership for Recommended LPA

Fare Zone Pairs	Stations Included in Fare Zone Pair	2002 Observed On/Off Counts	Modeled Daily Boardings	
			No Build	LPA
GHI	Geneva-Elburn	1,698	3,186	3,772
EF	Glen Ellyn-W. Chicago	5,194	5,629	7,064
CD	Maywood-Lombard	4,497	4,771	5,928
AB	Kedzie-River Forest	1,386	1,721	1,932
	Totals	12,775	15,307	18,696

7.2 Transportation System User Benefits

The refined Cost Effectiveness Index for the recommended LPA is $23.25. Table 7.2 provides a breakdown of the inputs to the user benefit calculation; Table 7.3 lists the cost effectiveness ratings and values established by the FTA for FY2009.

Table 7.2: Estimated Transportation System User Benefits

Total Capital Cost (2007$)	$491.2 M
Annualized Capital Cost (2007$)	$39.2 M
Annual Operation & Maintenance Cost (2007$)	$7.6 M
Total Annualized Cost (2007$)	$46.8 M
Daily User Benefits (hours)	7,438
Annualization Factor	270.5
Annual User Benefits (hours)	2,012,000
Cost Effectiveness Index (2007$)	*$23.25*
Anticipated New Starts Rating	*Medium*

Table 7.3: FY2009 Cost Effectiveness Breakpoints

Cost Effectiveness Rating	Cost Effectiveness Value (2007$)
High	less than or equal to $11.99
Medium-High	between $12.00 and $15.49
Medium	between $15.50 and $23.99
Medium-Low	between $24.00 and $29.99
Low	greater than or equal to $30.00

8.0 Next Steps

After an LPA is selected it will then be submitted to the Chicago Metropolitan Agency for Planning (CMAP) for inclusion in the 2030 Regional Transportation Plan, the financially-constrained long-range transportation plan for the metropolitan area. The LPA will also need to go through a series of additional steps in order to continue through the New Starts process. These steps are summarized below.

8.1 Environmental Analysis

In order to ensure that the LPA satisfies the requirements of the National Environmental Policy Act (NEPA), an Environmental Analysis (EA) will be performed. The EA will determine if there are significant impacts that may need to be addressed in order for the proposed LPA to move forward. The EA for the UP-W was initiated in June 2007, and will continue through preliminary engineering.

8.2 Continued Coordination with Stakeholders

During the preliminary engineering and environmental review process, coordination with the Executive Steering Committee, stakeholders, and the general public will continue. Metra will coordinate closely with the UP to ensure that implementation of the LPA occurs within the context of the UP's capital and operating programs while minimizing negative impacts to Metra operations. Metra will also coordinate closely with the FTA to ensure all issues with the LPA are resolved in compliance with both New Starts and NEPA requirements.

8.3 Resolution of Outstanding Issues

As noted earlier, there are several outstanding issues to be resolved, many of which are contingent of the progress of other projects and developments. Most notable of these are the proposed Circle Line station at Ashland and the proposed consolidation of the Melrose Park and Bellwood stations. Metra will continue to coordinate with the affected stakeholders associated with these issues. In addition, as the LPA nears implementation, Metra will coordinate with Pace and the CTA to ensure proper connections are made between Metra and the activity centers within the study area.

8.4 Submittal to FTA/Request to Enter Preliminary Engineering

Metra will submit the findings of the Alternatives Analysis and recommended LPA to the FTA for their review. The submittal will include the New Starts templates established by FTA to allow comparison with other projects competing for New Starts funding. The templates will also document the process used to identify the LPA, including both technical analysis and inputs provided from stakeholders in the study. Once approved by the FTA, the study would then continue into preliminary engineering, where the LPA concept would be developed into design drawings to be used in refining estimates of costs, ridership, and potential environmental impacts.