

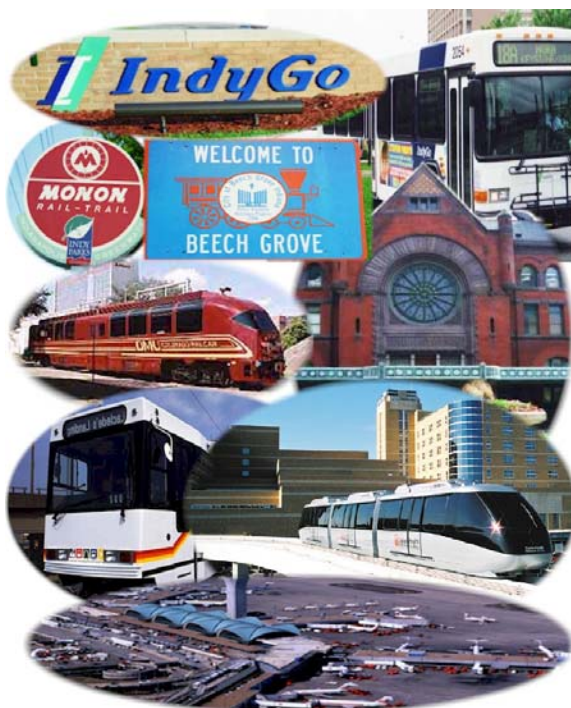


INDIANAPOLIS
METROPOLITAN PLANNING ORGANIZATION

Tech Memo

Performance Measures and Evaluation Process

Indianapolis Metropolitan Area Rapid Transit Study



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Appendices by Reference

Appendix A – Indianapolis Metropolitan Area Rail Rapid Transit Study Request for Proposal, MPO, May 2002

Appendix B – Transportation Efficiency Act for the 21st Century, Section 1203 Metropolitan Planning, US Congress, January 1998



Tech Memo I-5A Performance Measures and Evaluation Process

I. INTRODUCTION TO THE PERFORMANCE EVALUATION PROCESS

The purpose Technical Memorandum 5A is to outline the performance measures for evaluating alternative transportation systems for the Indianapolis region. The evaluation process will utilize a two-phase analysis approach, incorporating a screening activity (Level I) for initial system-level evaluation, and a more detailed evaluation (Level II) for corridor-level analyses for the three most promising regional system plans. A broad range of potential transit corridors (Level I) will be considered for the Indianapolis metropolitan area, based in part on the findings of Tech Memo I-4, which presents a review of earlier rail transit study proposals. Different modes (e.g., light rail transit (LRT), commuter rail, bus rapid transit (BRT)) will be considered for these corridors as part of the definitions of regional system options (including downtown circulation and bikeways/pedestrian trails). The regional system options will utilize the findings of Tech Memo 1-7A, which provides a technology assessment. The Level I review will be a “fatal flaw” scale of analysis, leading to the selection of up to six preliminary system level alternatives. For the Level II review, up to three of the most promising regional systems, or composites thereof, along with the no-build alternative, will be evaluated in more detail at the corridor level.

Federal guidance and local guidance are the foundation for the proposed evaluation measures. The federal Transportation Equity Act for the 21st Century (TEA-21), Section 1203, addresses a general metropolitan planning goal “to encourage and promote the safe and efficient management, operation, and development of surface transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and through urbanized areas, while minimizing transportation-related fuel consumption and air pollution.” TEA-21’s metropolitan planning guidance is focused on implementing coordinated planning to achieve an intermodal transportation system in a metropolitan area. The planning process is intended to “provide for consideration of projects and strategies that will—

- (A) support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- (B) increase the safety and security of the transportation system for motorized and unmotorized users;
- (C) increase the accessibility and mobility options available to people and for freight;
- (D) protect and enhance the environment, promote energy conservation, and improve quality of life;
- (E) enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- (F) promote efficient system management and operation; and
- (G) emphasize the preservation of the existing transportation system.”

TEA-21 further specifies: (a) specific steps that the Federal Transit Administration (FTA) must take to fund “New Starts” transit “guideway” capital investments; and (b), criteria that FTA must address in ranking projects for funding. Specific TEA-21-required steps include a systems planning step and the following project development steps: alternatives analysis and preliminary engineering; project justification; and local financial commitment. The requirements of the National Environmental Policy Act of 1969/NEPA must be met concurrently with the Level II

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analysis. The project justification criteria are: mobility improvements; environmental benefits; operating efficiencies; cost effectiveness; and other criteria, to which FTA has added transit supportive land use and future patterns.

Locally, the following issues have been identified: increasing traffic congestion, rising concern for workers' limited mobility and access to jobs, loss of open space, plus vehicle-generated air pollution problems that cumulatively have a negative effect on the area's economic growth. As a result, the MPO is conducting the Indianapolis Metropolitan Area Rapid Transit Study. This study is focused on identifying and evaluating a regional network of transit improvements to address the identified problems.

For the Northeast Corridor Study, the MPO used the following criteria to screen alternatives and to guide the selection process, applying quantitative measures whenever possible: transportation/effectiveness; environment; cost; financial feasibility; equity; and anticipated public acceptance.

II. REGIONAL RAPID TRANSIT PERFORMANCE MEASURES AND EVALUATION PROCESS

A. Performance Measures

The following key performance criteria are proposed for formulating regional transit system options:

Intermodal Compatibility

Does the proposed option accommodate freight and intercity passenger (Amtrak and future high-speed-rail) operations? Does the option provide for a good interface with intercity transportation options (existing/proposed air and passenger rail facilities), as well as with an IndyGo bus hub and line routes? Does the option have the potential to interface with pedestrian links and bicycle/hiking trails?

Regional Mobility

How well does the proposed option provide good geographic transit-service coverage throughout the region? How well does it serve the region's major population densities and employment concentrations? How well does it serve the region's key destinations and attractions, for example, downtown?

Equity

How well does the proposed option improve speed, comfort, and reliability for all existing and all potential transit users in the region? How well does it increase accessibility to all users in the region? Does it improve mobility for transit-dependent users?

Environmental Compatibility

How well does the proposed option potentially avoid significant adverse environmental effects, such as: large numbers of displacements; parkland, historic, and archeological takings; natural resource displacements; threatened & endangered species habitat takings; environmental justice concerns; and severing neighborhoods? How well does the option potentially enhance air quality, encourage reinvestment in older areas, and support land use planning goals and objectives?

Development Stimulus

How well does the proposed option enhance existing and proposed development? Does it offer the potential to stimulate significant new development at underutilized non-performing sites? Do any of its

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development-stimulus opportunities offer potential for transit-oriented development (TOD) that will enhance transit ridership? Does it offer any value-capture opportunities that could help pay for its operating costs?

Cost

Is the proposed option potentially financially feasible to build and operate?

Anticipated Public Acceptance

Is the proposed route likely to be acceptable to a significant number of persons and interested/affected groups?

B. Evaluation Process

The process to be used to evaluate the multiple theoretically possible corridors and possible systems of corridors within the Indianapolis region's ubiquitous network of all reasonable transportation corridors is to weed out those options with fatal flaws. Once those with fatal flaws have been eliminated, then the remaining corridors can be evaluated for their potential to form regional transit systems that can be presented to the public for comment and be evaluated in greater detail. The following table lists each of the Level I performance measures discussed above and expresses the essence of the fatal flaw check-off for each.

Level I Performance Measures

Performance Measure	Fatal Flaw	Yes	No
Intermodal Compatibility	Is the option in conflict with freight rail, intercity passenger rail, etc.?		
Regional Mobility	Does the option fail to serve major transit needs?		
Equity	Does the option fail to yield an equitable solution for all socio-economic strata in the region?		
Environmental Compatibility	Does the option have significant insurmountable environmental impacts?		
Development Stimulus	Does the option lack any significant development opportunities?		
Cost	Is the option potentially financially feasible to build and operate?		
Anticipated Public Acceptance	Will the option likely engender significant insurmountable opposition?		

From the summing list of potential viable corridors, a large number (4 to 10) regional transit systems will be created, which provide service in corridors with potentially high travel demand, which interconnect the CBD and other major activity centers, which make use of potentially available rights-of-way, which support rational land use objectives and which provide social equity.

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III. PERFORMANCE MEASURES AND EVALUATION PROCESS FOR ALTERNATE REGIONAL RAPID TRANSIT SYSTEMS

A. Performance Measures

A number of key performance criteria are proposed for evaluating the relatively large number of regional transit network options defined above. Many of the previous performance measures will be met by all of the regional system alternatives, such as avoiding major freight/passenger conflicts, providing good transit service, being potentially acceptable to the public, and so will not be specifically addressed at this level of review. Similarly, all of the regional systems may be assumed to benefit air quality; involve construction noise, which may be mitigated; and create construction jobs (direct and induced) in relation to their capital cost and long-term jobs (direct and induced) in relation to their operating cost. Hence, these universal measures are also not specifically addressed at this level of review, although they will be addressed in the environmental impact statement for any option(s) carried to that stage. Rather, the performance measures at this level of analysis are focused on those items that may show differences among the options under consideration for the purpose of identifying the best candidates for further study. The following paragraphs describe some 16 proposed Level II discriminator performance measures grouped under four headings.

Transportation Gains

(Ridership potential; congestion relief; high-traffic bus corridor; network links)

Probably the most significant factor in measuring the success of a rapid transit system is ridership. Does the system draw significant numbers of patrons? The trip-making potential among the transportation zones linked by a potential transit corridor is important in defining the corridor's ridership potential. Another measure of the corridor's transit potential is the traffic congestion within that corridor. While relieving such congestion is typically a project goal, having the congestion increases the propensity for commuters/special-event patrons to switch modes from auto to transit. Likewise, having a high-ridership transit line(s) in the corridor provides a good base for rapid transit in that corridor. Finally, if the corridor is or can be linked well to multiple other corridors and modes (a downtown intracity bus hub, hiking and bike trails, etc.) then the rapid transit line patronage can gain from the distribution links provided by these other corridors and modes at the beginning or the end of a rapid transit trip, enhancing the number of rapid-transit trips likely to be made.

Social & Economic Effects

(Residential & business/employee displacements; neighborhood access severance; environmental justice; historic, archeological, & parkland displacement/ encroachment; visual/aesthetic intrusion.)

Social and economic effects are among the key discriminators among transit corridor options. The number of displaced residential units, if large, can be a significant factor. Similarly, the number of business, especially those with large numbers of employees, although potentially relocatable, is also a factor. Severing a neighborhood or a primary access to a neighborhood can introduce a significant problem that may be difficult to mitigate. Environmental justice involves avoiding disproportionately adverse effects on low-income minority groups, for example, concentrating residential displacements in low-income neighborhoods. Displacing or encroaching on National Register/National Register-eligible

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historic properties, known archeological sites, or publicly-owned [Section 4(f)] parkland need to be avoided if prudent and feasible alternatives are possible, or if no such alternatives are possible, then all possible planning measures to mitigate harm need to be employed. Also, visual and aesthetic intrusion, especially in visually sensitive areas, is an issue that may affect the quality of life in the community.

Environmental Effects

(Wetland/floodplain displacements; natural area takings; threatened & endangered species impact; hazardous waste clean-up)

Adverse effects on the natural environment need to be avoided where possible. Specifically, wetlands need to be avoided, or where this is not possible, then replacement wetlands need to be created at a ratio usually several times greater than the actual displacement. Similarly, floodplain encroachment should be avoided where possible, and where such encroachment cannot be avoided, then additional flood storage replacement capacity needs to be created. Loss of natural areas is also a concern, which is especially significant if threatened & endangered plant or animal species may be located in the area and cannot be avoided, in which case, specific mitigation measures will need to be developed. Finally, hazardous waste materials, if encountered along a proposed option, will need to be cleaned up, adding to the cost of implementing that option. Major contamination problems, notably, Superfund sites, should be avoided because of their considerable cost and timeline required for clean-up.

Land Use Gains

(Supports Downtown; supports regional attractions and destinations; provides development/redevelopment opportunities, as well as direct and indirect employment.)

A transit corridor can be a significant organizer for regional development. Clearly, Indianapolis region has focused investment on achieving a healthy downtown, and rapid transit options that support downtown will be critical to fully realizing that goal. Similarly, transit options that serve regional attractions and destinations will be important to realizing strong regional development and good transit ridership. In addition, the transit option should be able to serve undeveloped or underdeveloped sites for which rapid transit access could be a catalyst for economic development, which can be transit oriented.

B. Evaluation Process

A specific unit of measure will be estimated for each of the 16 performance measures, based on a review of published sources and windshield surveys, or limited preliminary analysis. Then, the range of units of measure for each performance measure will be ranked from one to five, as follows: one (poor); two (fair); three (average); four (good); and five (very good). The 16 performance measures may be prioritized by the public, which will permit factoring the rankings for each measure according to the public's perceived significance of each measure. The three options with the highest point totals will offer the greatest opportunity for further refinement and analysis. The table on the following page lists the 16 performance measures, the units of measure, and remarks on the methodology that can be used to measure those units.

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Performance Measures

Category	Performance Measure	Unit of Measure	Methodology Remarks
Transportation Gains	Ridership Potential	raw estimate of trip-making potential	preliminary analysis
	Congestion Relief	highway traffic congestion (LOS)	INDOT data
	High-traffic bus corridor	best-performing bus routes	IndyGo data
	Network links	number of bus, bus hub, and trail connections	IndyGo network data, etc.
Social & Economic Effects	Residential & business/employee displacements	raw estimate of displacements with employee considerations	aerial counts and windshield survey
	Neighborhood/neighborhood access severance	number of severances	aerial photo and windshield survey
	Environmental justice	displacements of low-income minority households, jobs, and institutions	Census data review and field inspection
	Historic, archeological, & parkland displacement/encroachment	numbers and significance of displacements/encroachments	review of SHPO/published data and field review
	Visual/aesthetic intrusion	numbers of intrusions	visual inspection
Environmental Effects	Wetland/floodplain displacements	estimates of acreage of each	published data and field review
	Natural area takings	estimate of displaced acreage	field inspection
	Threatened & endangered species impact	numbers of potentially affected species	review of published sources
	Hazardous waste clean-up	numbers and significance of site	review of published data and field check
Land Use Gains	Supports downtown	direct connection and station access	visual inspection
	Supports regional attractions and destinations	direct connection and station access	visual inspection
	Provides development/redevelopment opportunities	direct link and station access to undeveloped/underdeveloped sites	aerial photo review and field inspection

This second level of analysis is repeated on the three surviving regional rapid transit system plans after some further refinement and analysis. The regional system plan that receives the highest score in this second iteration will be defined as the locally preferred (i.e., the most cost-effective) regional rapid transit system – the system to be carried into the next major phase of this study.

NOTE: Tech Memo 5B: Summarize the Systems Level Alternative Analysis will be incorporated into Tech Memo 7C: Regional Systems Evaluation Report.