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Figure I-1: Route Diagram for LYNX Blue Line, Charlotte, North Carolina

Figure I-2: Route Diagram for DART North Central Corridor, Dallas, Texas

Figure I-3: Route Diagram for EmX in Eugene and Springfield, Oregon

Figure I-4: Route Map for Interstate MAX, Portland, Oregon

Figure I-7: Route Diagram for Utah Transit Authority (UTA) University and Medical Center Extensions, Salt Lake City, Utah

Figure I-8: Route Diagram for Branch Ave. Green Line Extension, Washington, DC

Table 4: Success Indicators from TCRP Project H-42 Case Studies

Criterion (Rule of Thumb)	Measure of Project Success	Charlotte	Dallas	Eugene	Portland	Salt Lake City	D.C./MD
Provide fixed-guideway transit where bus ridership is already high	Ridership / Consolidated bus operations		●	●	●	●	●
Select high-visibility corridors where patrons will feel safe	Ridership				●		
Connect CBD with suburban park-and-rides near a congested belt loop	Ridership / Sustainability / Congestion relief / Consolidated bus operations	●	●				●
Minimize stations to maximize speed	Ridership / Sustainability / Congestion relief	●		●			
Minimize grade crossings and in-street operations to maximize speed	Ridership / Sustainability / Congestion relief	●	●	●	●		●
Provide fixed-guideway transit in corridors where parallel highway infrastructure is heavily congested	Ridership / Sustainability / Congestion relief	●	●		●		
Connect multiple employment centers	Ridership / Sustainability / Congestion relief		●	●		●	●
Connect major regional destinations	Ridership / Economic development			●	●	●	
Place alignment in close proximity to commercial property	Ridership / Economic development				●	●	
Place stations in busy locations where "eyes on the street" provide sense of safety	Ridership				●		
Provide service that has average travel speeds greater than existing bus routes	Ridership / Consolidated bus operations	●	●			●	●
Provide transit in high-demand travel corridors where alternative capacity is prohibitively expensive	Economic development	●	●		●	●	
Maximize the number of stations	Economic development / Real estate values	●		●	●		●
Place alignment along corridors with ample development potential to facilitate urban growth as described by local land use plans or regional plans	Real estate values	●		●	●	●	
Provide fixed-guideway transit in corridors where inexpensive right-of-way can be easily accessed	Construction completion / Minimized impacts	●	●	●	●	●	●
Maximize distance between alignment and single family neighborhoods; Minimize taking of residential property	Minimized impacts / Public support	●		●	●		●
Identify corridors that can help garner local political support for further transit system investment	Public support	●		●			●
Select corridors that garner congressional support	Public support	●			●		●
Locate stations in low income areas or in communities of color	Dependent riders / Economic development			●	●		●
Provide substantial bus layover facilities at stations	Consolidated bus operations		●			●	●

Data collection

- We developed a geographic database of fixed-guideway transit projects built 1974-2008, the corridors and stations where they operate, metropolitan areas they serve, and the routes and stops of almost all fixed-guideway transit systems in the United States.
- Data collection included project and system ridership capital cost, service frequencies, measures of connectivity to the larger transit network, regional and local demographics, and the relative costs of driving in terms of parking and congestion.

Figure 4.2. Fixed-guideway transit projects included in analysis.

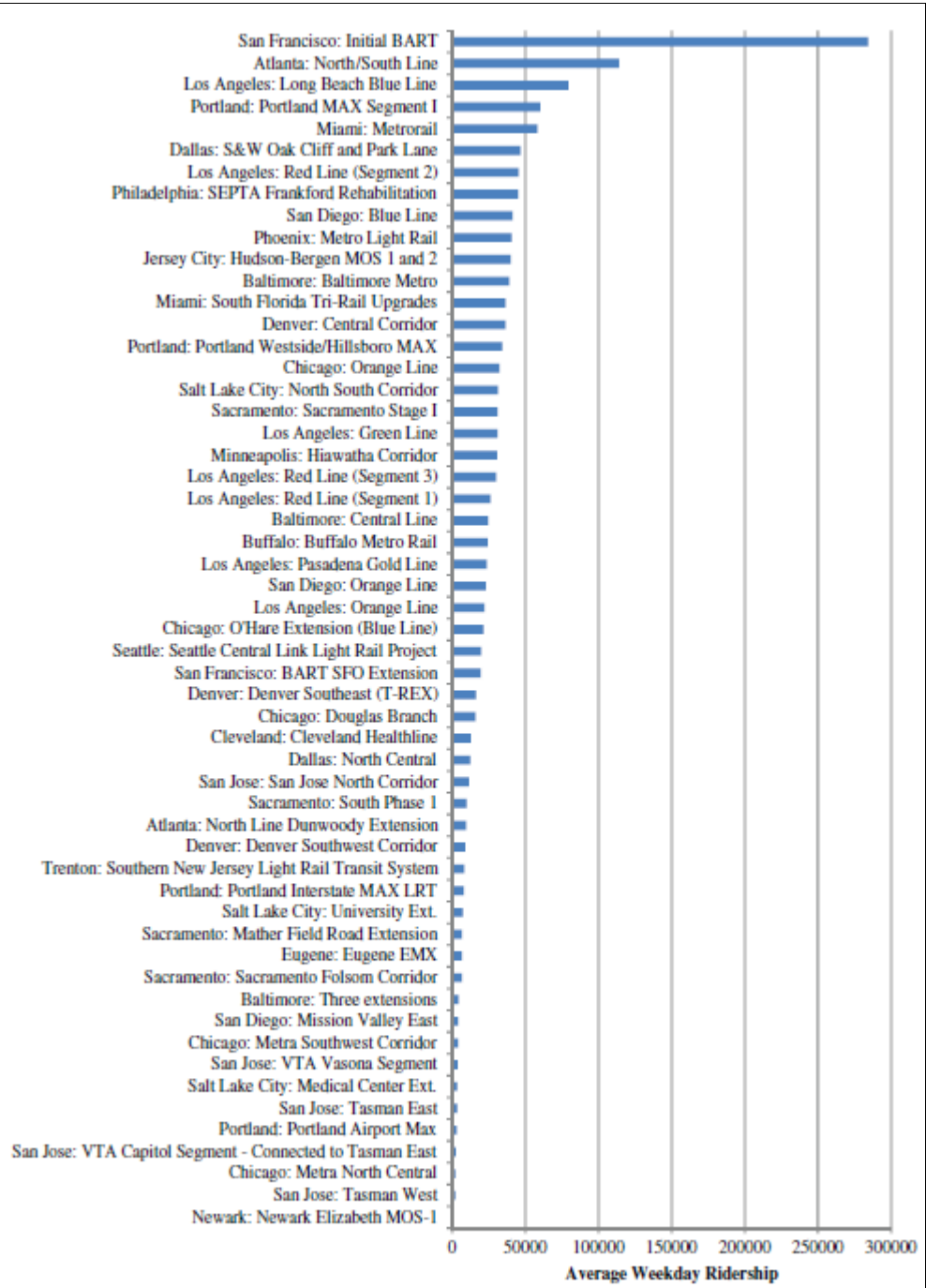

Figure 4.3. Average weekday ridership, by fixed-guideway transit project included in analysis.

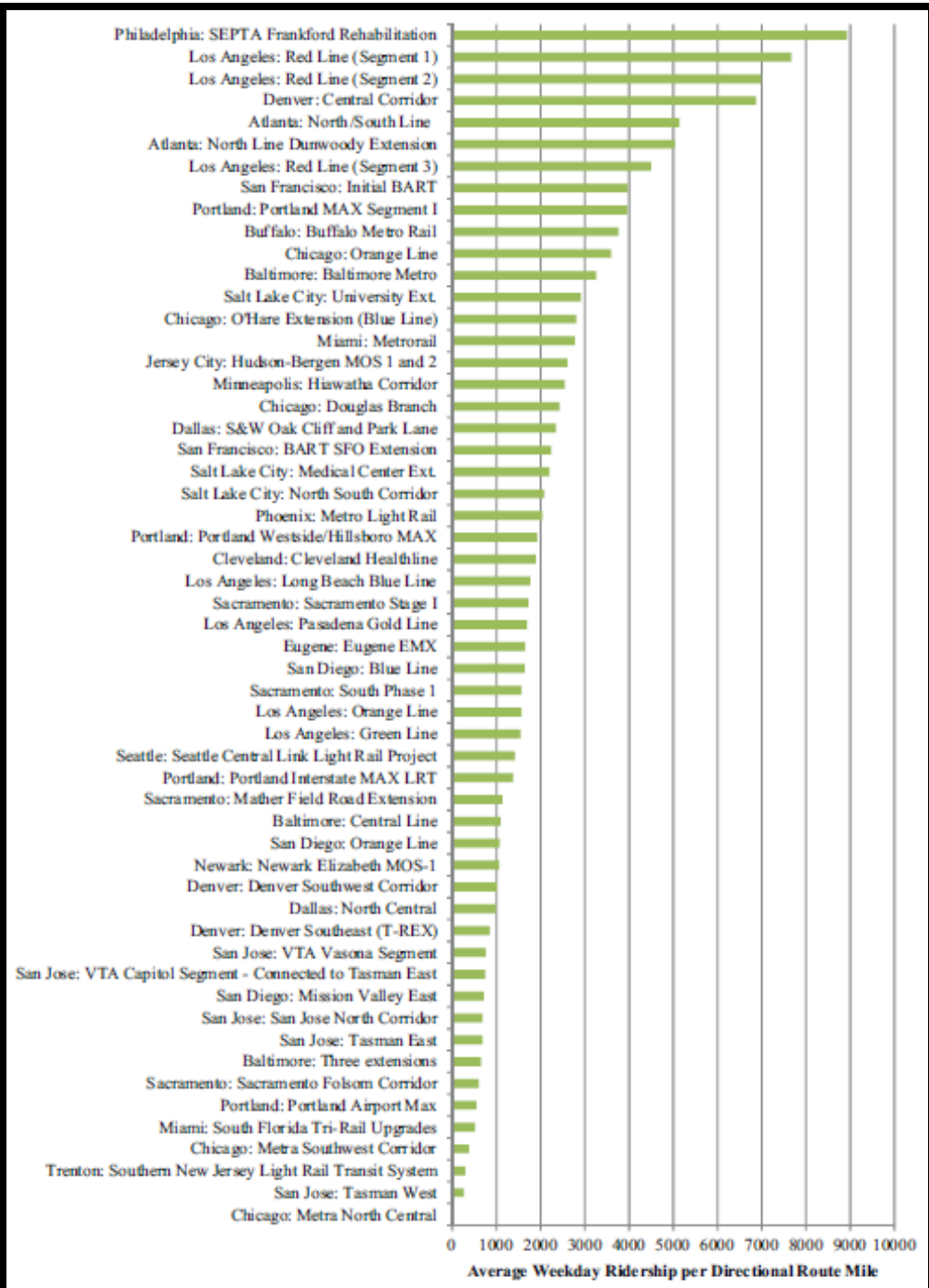

Figure 4.4. Average weekday ridership per directional route mile.

Additional elements of H-42 study

- Reviewed previous studies on ridership and its relationship to service characteristics and features of the surrounding area
- Conducted focus groups and interviews with transportation professionals to identify factors used to define and predict success of transit investments in real-world situations

Analysis overview

- Two data sets:
  - 55 projects, primarily heavy rail transit and light rail transit, with a few commuter rail and BRT projects
  - 244 metro areas over an 8-year period
- Two success metrics:
  - Average weekday ridership (project-level, rail only)
  - Change in annual passenger miles traveled (PMT) for all transit in the metro area

Summary of results and comparison with previous studies

- We used aggregate demand models to investigate the impact of indicators on ridership and PMT
- Population and employment density were highly predictive of transit ridership
- The combination of indicators are more influential than on their own
- We found some often-cited predictors of success to be insignificant

Metropolitan-area analysis of transit passenger-miles traveled

- We tested how metropolitan-level PMT was related to hundreds of possible indicators
- Jobs, population, and other indicators were measured near all fixed-guideway transit stations in the metropolitan area, not only near project stations
- We also tested indicators consisting of characteristics of the metropolitan area as a whole

Table 5.5. Metropolitan-level PMT models.

Variable Name	Final		Census
	Catchment-Level	*MSA-Level*	*MSA Variables*
Catchment jobs	-2.542***	-2.608***	-2.212***
Catchment population	-0.223	-0.202	-0.661***
Catchment leisure jobs	8.441***	8.299***	7.412***
Catchment high-wage jobs	3.279***	3.464***	3.157***
FHWA congestion index	-1.088	-1.282*	-1.123*
PMT interaction term	0.061***	0.056***	0.048***
MSA jobs		0.120*	-0.322***
MSA high-wage jobs		-0.076	0.486***
MSA leisure jobs		0.355	0.189
MSA population (U.S. Census)			0.273***
MSA population (BEA)	0.147***	0.115***	
Constant	-18,977.0	-29,783.5*	-64,450.4
# of observations	1,641	1,641	1,641
Cluster-specific variance	145,053.9***	141,380.8***	147,803.0***
Other variance	14,624.4***	14,531.2***	13,129.8***
BIC score	37,789.2	37,781.0	37,519.3

*$p < 0.05$, ***$p < 0.001$, BIC = Bayesian information criterion.

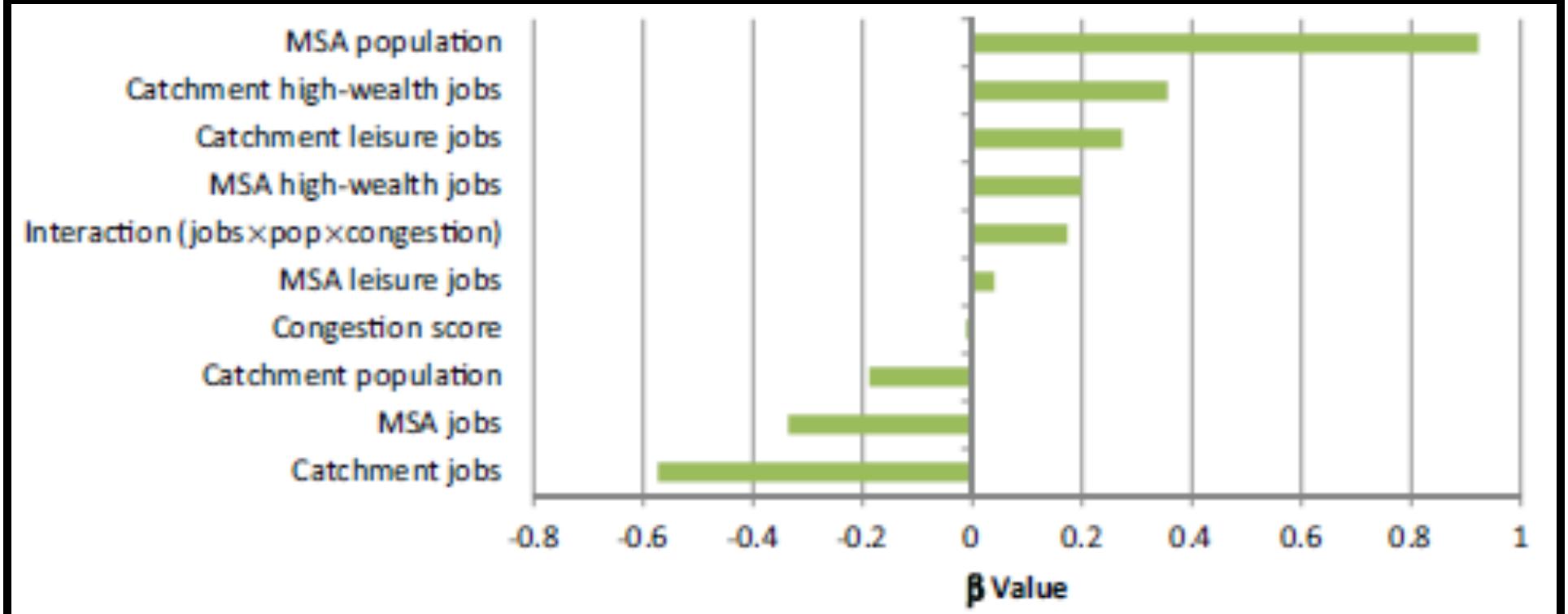

Figure 5.6. Beta values for final PMT model (MSA level).