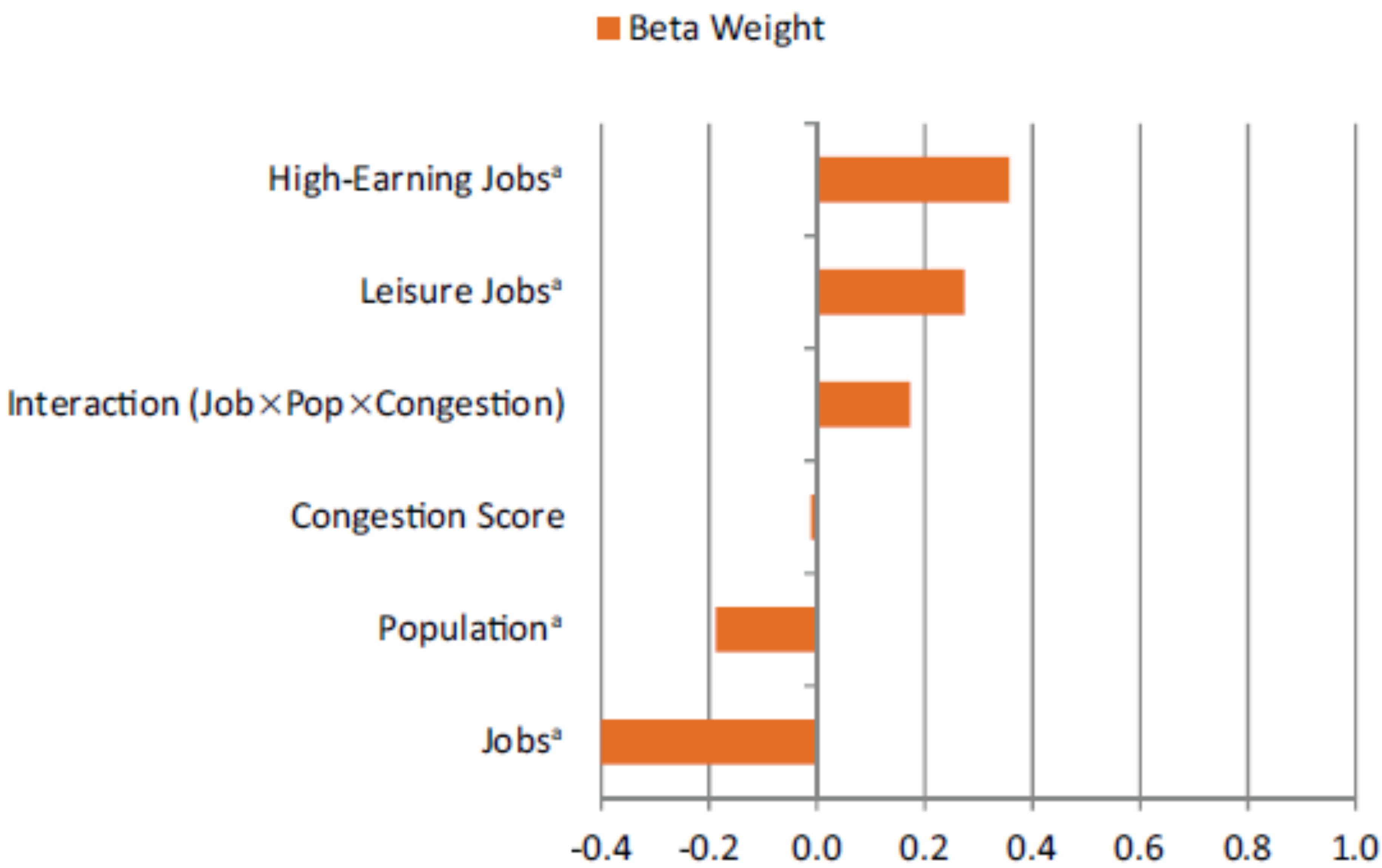


[a]Measured within 1/2 mile of all fixed-guideway transit stations in the metro area

Figure S.3. Influence of variables in PMT model.

[redacted]

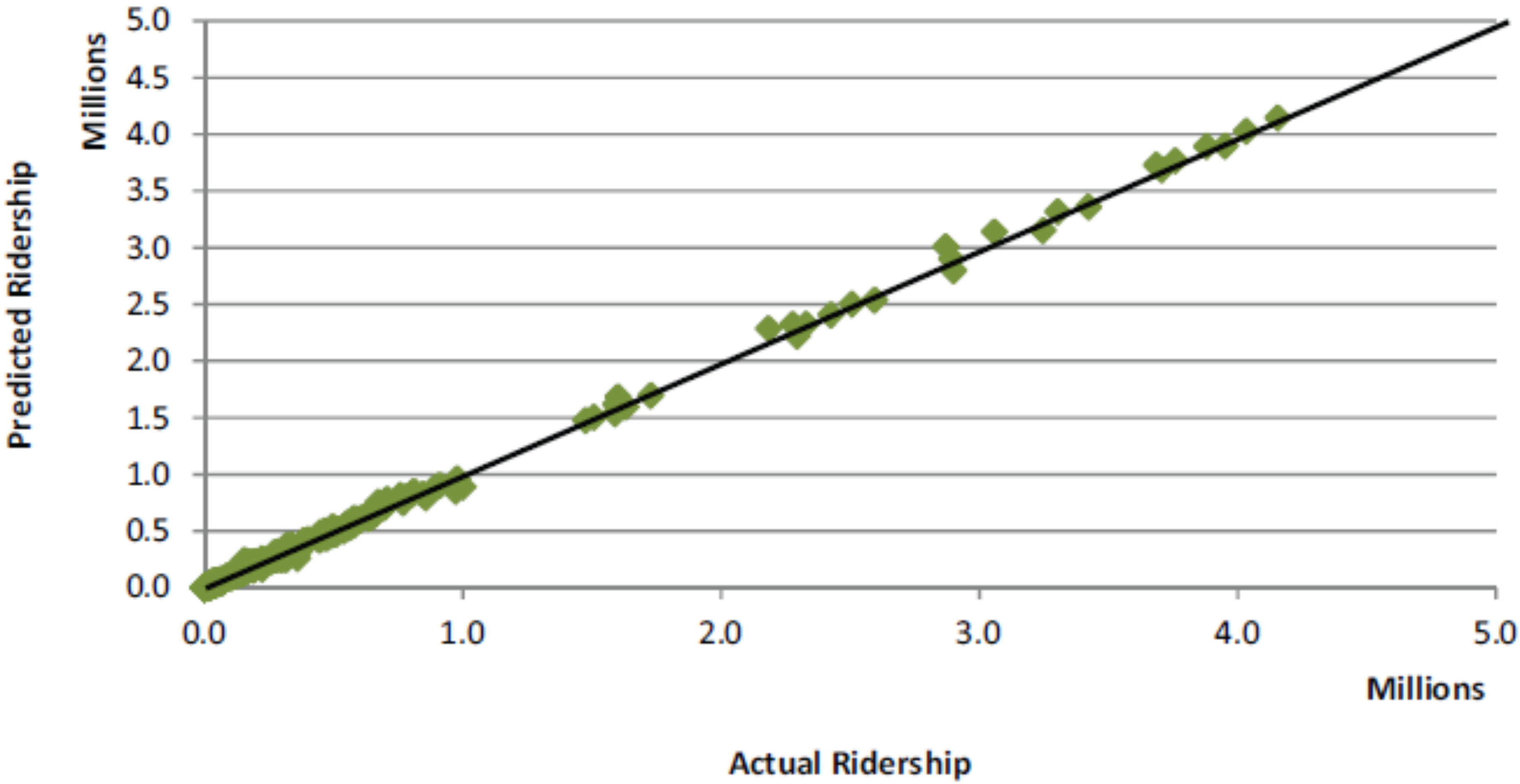


Figure S.4. Goodness of fit of final PMT model.

[redacted]

Project-level ridership analysis

- We tested how the average daily ridership on a project was affected by hundreds of measured factors

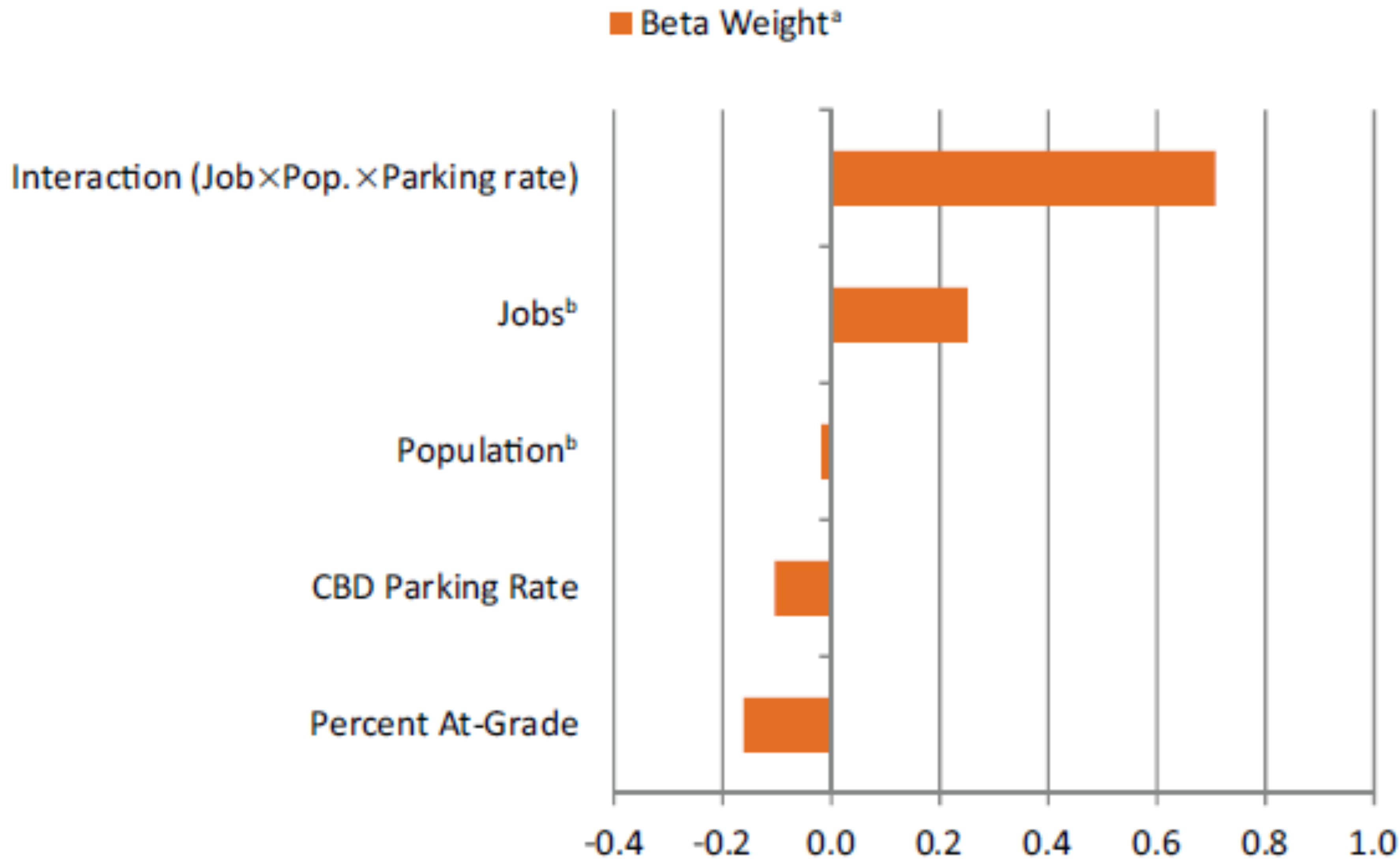
Table 5.2. Summary of variables in final ridership models.

Variable Name	Abbreviation	Definition
Catchment jobs	P_Jobs	Jobs within 1/2 mile of project stations
Catchment population	P_Pop	Pop. within 1/2 mile of project stations
CBD parking rate	P_Rate	Daily parking rate in CBD
Ridership model interaction term	R_Int	(I_Jobs × I_Pop × P_Rate)/(1 million)
Percent at grade	%_Grade	Percent of alignment at grade
Missing at-grade values dummy	D_Grade	1 if %_Grade info missing; 0 if not
Number of park-and-ride spaces	P&R	Number of park-and-ride spaces
Project age	Age	Age of the project

Table 5.3. Summary of project-level ridership models.

Variable Name	Final Models		Rejected Models		
	Endogenous	*Defensible*	*Model C*	*Model D*	*Model E*
Catchment jobs	0.117**	0.155	0.0646	0.122**	0.324**
Catchment population	0.0384	-0.0140	0.00103	0.0441	0.309*
CBD parking rate	-393.6	-491.9*	-354.2	-462.7	
Ridership interaction term	0.0455**	0.0773***	0.0441*	0.0470**	
Percent at grade	-9,971.6*	-17,846.2*	-10929.1*	-3028.4	
Missing at-grade dummy		3,294.39			
Park-and-ride spaces	3.383**		3.170*	3.139**	
Age of project	707.9**	1,040.3**	574.3*	659.0*	
Number of bus lines			100.4		
Level of service			340.2		
HRT dummy variable				7,757.3	
BRT dummy variable				880.2	
CONSTANT	8,235.4	20,672.69**	5,917	2,854	-11,258.3
Number of observations	50	55	50	50	56
Adjusted R^2	**0.939**	**0.894**	**0.942**	**0.939**	**0.656**

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$



[a]The beta weight, or *beta value*, reflects the relative explanatory power of a variable in predicting ridership.
[b]Measured within 1/2 mile of project station.

Figure S.1. Influence of variables for ridership.

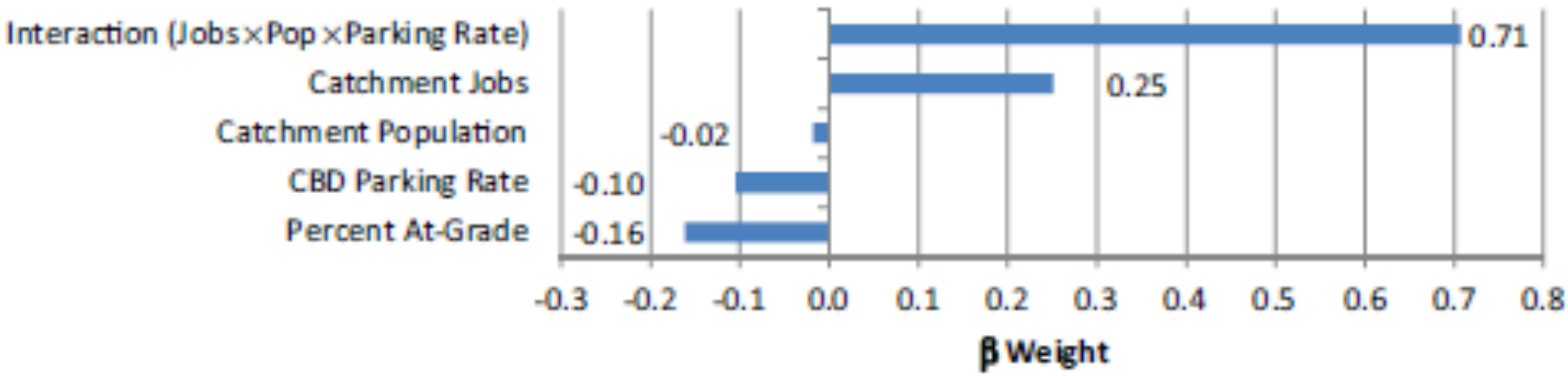


Figure 5.3. Beta weights for defensible ridership model.

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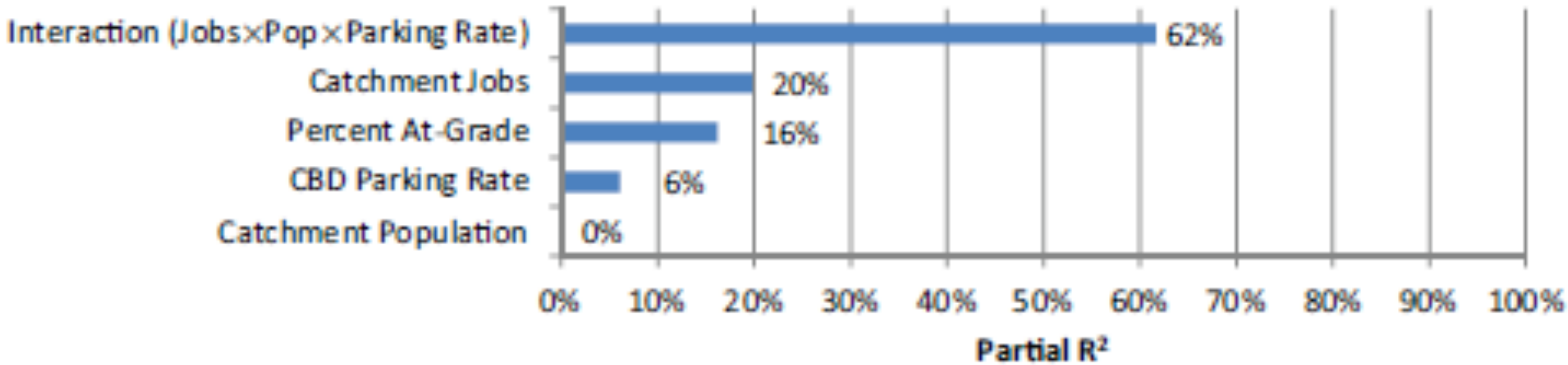

Figure 5.4. Partial R^2 values for defensible ridership model.

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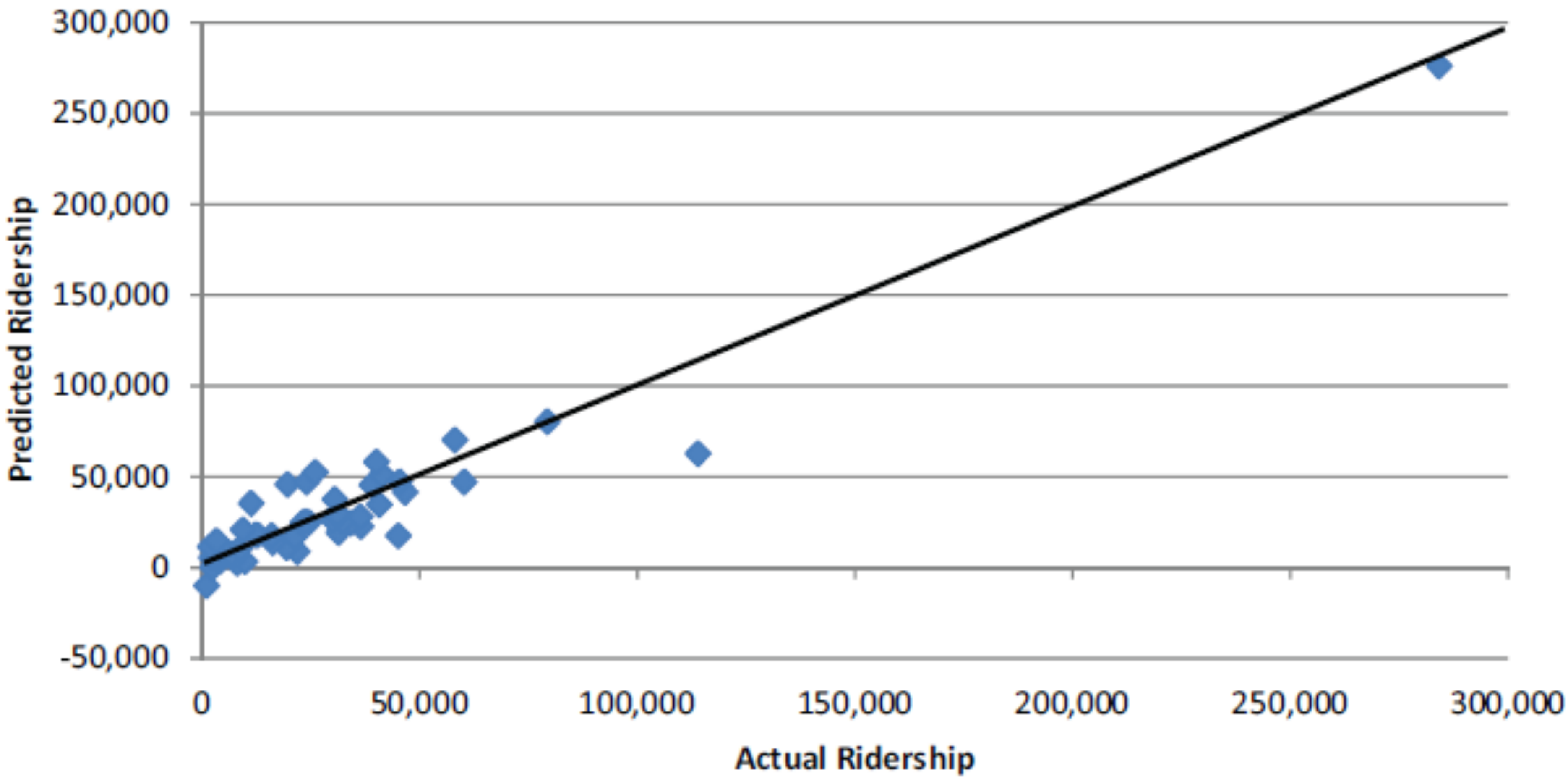

Figure S.2. Goodness of fit for ridership model.

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Table 5: Most Significant Indicators of Project Ridership and System-Wide PMT

Indicators of Project Ridership	Indicators of Change in PMT on System
• Employment within one-half-mile of project stations • Population within one-half-mile of project stations • Combination of employment and population within one-half-mile of stations and daily parking rate in the CBD • Percent of the project alignment at grade	• Metropolitan area population • Employment density within one-half-mile of fixed-guideway stations in the metropolitan area • Population density within one-half-mile of fixed-guideway stations in the metropolitan area • Higher wage jobs within one-half-mile of fixed-guideway stations in the metropolitan area • Average congestion in the metropolitan area (daily vehicle-miles traveled (VMT) per freeway lane-mile) • Retail, entertainment, and food jobs within one-half-mile of fixed-guideway stations in the metropolitan area • Interaction of jobs and population within one-half-mile of fixed-guideway stations in the metropolitan area

[redacted]

Table 5.1. Summary statistics for model variables.

Variable Name	Description	Obs[a]	Mean	Median
	Project Ridership Model			
Jobs near stations	Employment within ½ mile of project stations	55	70,355	46,107
Population near stations	Population within ½ mile of project stations	55	55,754	42,224
Transit utility	(Jobs × population × parking rate)/10^6	55	113,077	30,695
CBD parking rate	Daily parking rate in the CBD	55	15	14
Project age	Age of project	55	10	7
Ridership		55	28,470	21,350
Predicted Ridership		55	28,470	19,344
	Metropolitan Area PMT Model			
Jobs near stations	Jobs within ½ mile of fixed-guideway stations in metropolitan area	141[b]	250,112	187,042
Population near stations	Population within ½ mile of fixed-guideway stations in metropolitan area	141[b]	239,984	112,926
Leisure jobs near stations	Retail, entertainment, and food jobs within ½ mile of fixed-guideway stations in metropolitan area	141[b]	38,611	26,380
High-wage jobs near stations	Jobs with salaries exceeding $3,333/month within ½ mile of fixed-guideway stations in metropolitan area	141[b]	118,844	84,359
Congestion index[c]	Total VMT divided by number of freeway lane-miles in MSA (FHWA)	1,641	10,275	10,339
MSA jobs	Overall employment in MSA (LEHD)	1,888	211,323	86,621
MSA population	Overall population of MSA (BEA)	1,888	706,284	289,937
MSA leisure jobs	Retail, entertainment, and food jobs in MSA (LEHD)	1,888	44,533	18,973
MSA high-wage jobs	Jobs with salaries exceeding $3,333/month in MSA (LEHD)	1,888	72,267	26,222
PMT		1,888	84,309	6,775

[a] The ridership model has a single observation for each investment, whereas the PMT model records an observation for each year in each MSA.

[b] Catchment variables are summarized only over MSA-years in which catchment population was positive (i.e., those in which fixed-guideway transit was operating).

[c] Variable does not vary by year—multiple observations have repeated values

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

Conclusion

- This evaluation method is not meant to replace existing processes of planning, but to provide additional information that is consistent for all regions in the United States
- If a corridor or project is shown to have good potential for attracting ridership commensurate with its cost, it may be appropriate to conduct more detailed corridor-level planning studies

Figure I-5: Segment 7: Steel Bridge to Kaiser (Metro 1995)

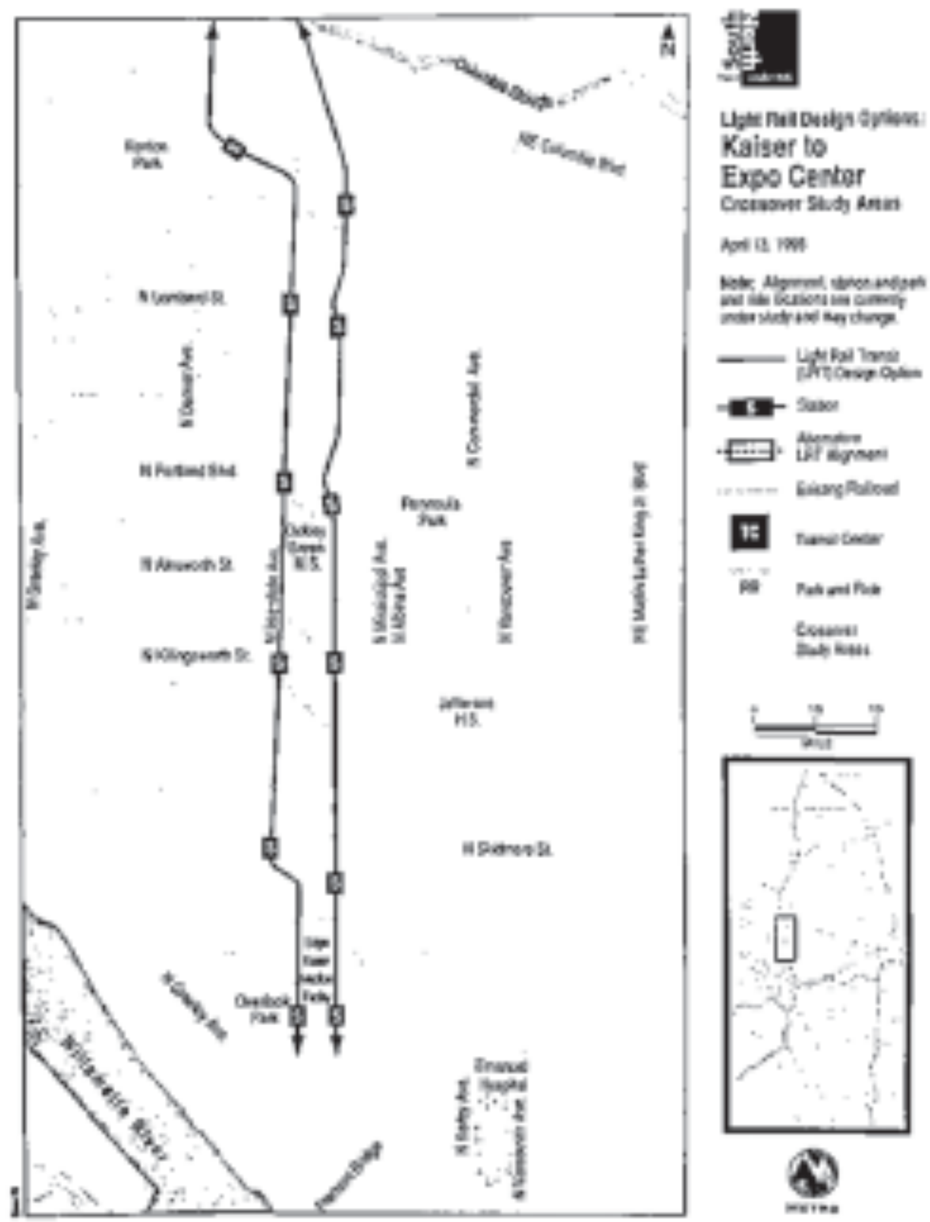

Figure I-6: Segment 8: Kaiser to Expo Center[149]

Table I-1: Summary Characteristics of Proposed Alignments (PMG 1998)

Characteristic	Interstate Avenue	I-5
Year of Expenditure Cost (millions)	$1,199	$1,085
LRT Weekday Ridership from Oregon City to 179th	64,000	65,400
Total Weekday Corridor Transit Ridership	131,350	132,800
Effective LRT Operating Cost (millions) from Oregon City to 179th	$18.14	$18.02
Cost-Effectiveness Ratio (lower is better)	8.36	7.94
Residential and Business Displacements (Interstate Avenue variations reflect different roadway designs to accommodate varied levels of automobile capacity)	40/65/120	70

Figure I-9: Alternative Alignments (Easternmost Infeasible Because of Navy Yard Station Location) (WMATA 1984)

Table I-2: Benefit-Cost Calculations for Routes Under Consideration in 1984 (WMATA 1984)

Benefit-cost measure	Rosecroft	S-Curve	Suitland
Total capital cost per trip (1990 ridership)	$30.98	$33.89	$29.12
Operating deficit per trip (1990 ridership)	$0.58	$0.54	$0.51
Capital cost per transit-dependent person in station catchments (1980)	$35,180	$34,532	$25,826
Operating deficit (1990) per transit-dependent person in station catchments (1980)	$654	$546	$450