

**Improving Access to Jobs via Effective Public Transportation:
A Planning Framework for San Juan**

Clayton Lane
June 7, 1999

Purpose
(Related to *Tren Urbano*)

Goal

- Improve understanding of major new transit investments' effects upon regional job accessibility.
- Help improve the job accessibility of low-income families in San Juan by recommending improvements to the transit system.

Objectives

- Evaluate the effects of *Tren Urbano*.
- Evaluate transportation services and land use policies based on their ability to improve job accessibility.

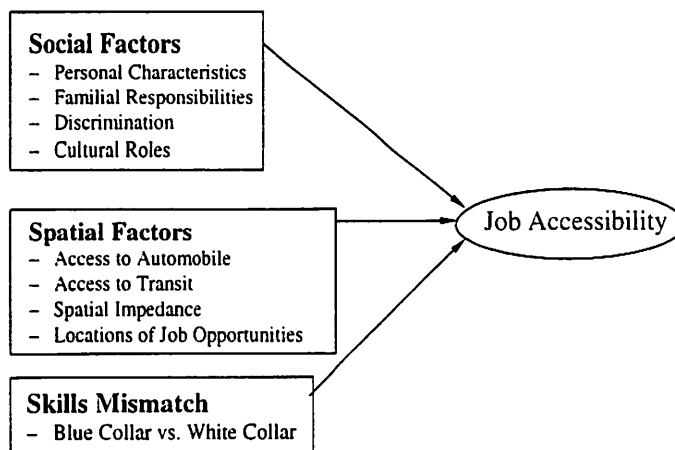
Benefits of Transit

- Accessibility
- Equity
- Economic Development
- Improve Air Quality
- Reduce Auto Congestion

Accessibility

Accessibility –

- The **potential** for social and economic interaction, for reaching a “multitude of destinations offering a spectrum of opportunities for work and play.”
- “**ease** with which spatially distributed opportunities may be reached from a given location using a particular transportation system.”



Parameters of Accessibility

- Close opportunities are more accessible than distant ones.
- The existence of more opportunities generally makes them more accessible.
- The existence of greater competition for capacity-constrained opportunities makes them less accessible.

Modeling Job Accessibility

Physical Accessibility:

$$A_i = \sum [Oppor_j \times f(Costs_{ij})]$$

$$800^2 = 640,000 \text{ calculations}$$

Competitive Accessibility:

$$A_i = \sum_j \left[\frac{Oppor_j \times f(Costs_{ij})}{Demand_j} \right]$$

$$800^3 = 512 \text{ million calculations}$$

$$Demand_j = \sum_i [W_k \times f(Costs_{i,j})]$$

Results from Study of Boston

Examined effects of:

- race upon poverty concentration
- poverty concentration upon job accessibility
- public transportation upon job accessibility, in context of the geography of low-income households

Found that:

- some aspect of race is a key factor in concentrating many-low income workers
- concentrated poverty reduces job accessibility
- good transit helps to even the economic "playing field"

Figure 4.17. San Juan: Physical Job Accessibility, "No Build"

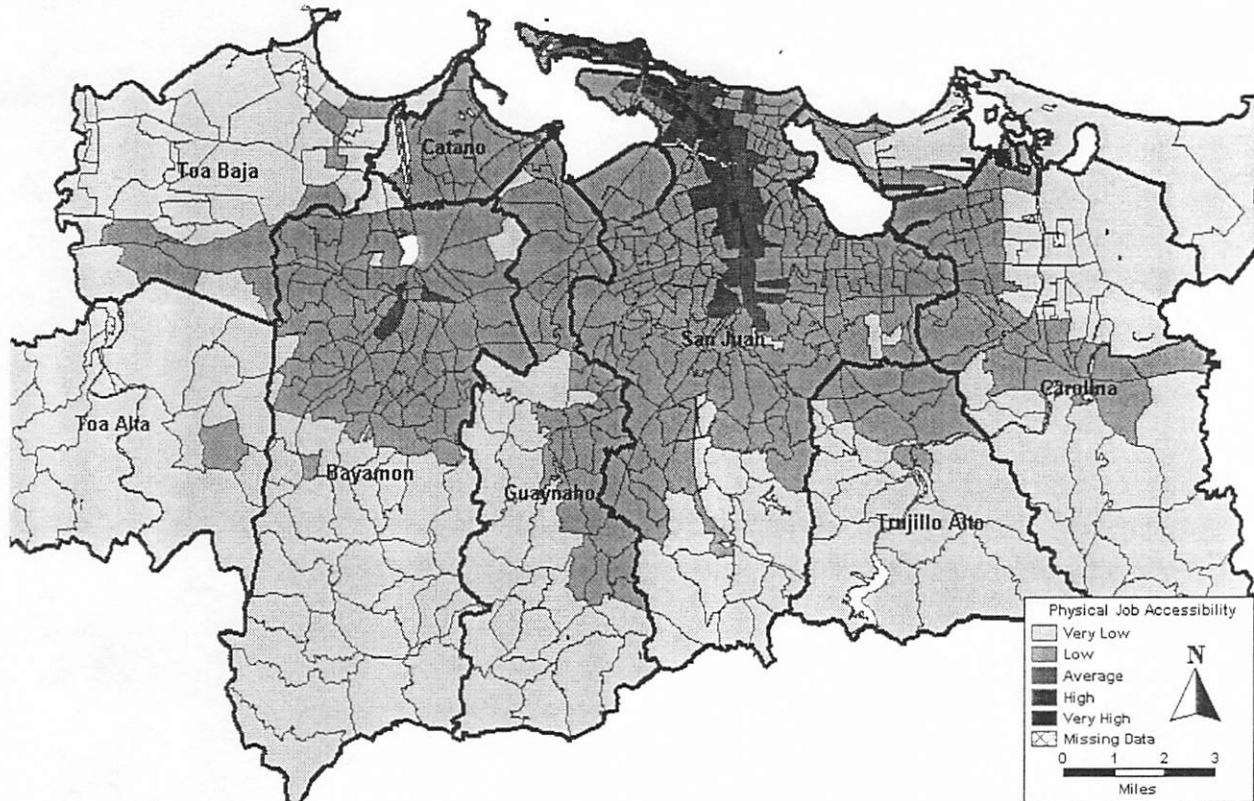


Figure 4.18. San Juan: Physical Job Accessibility, "Build"

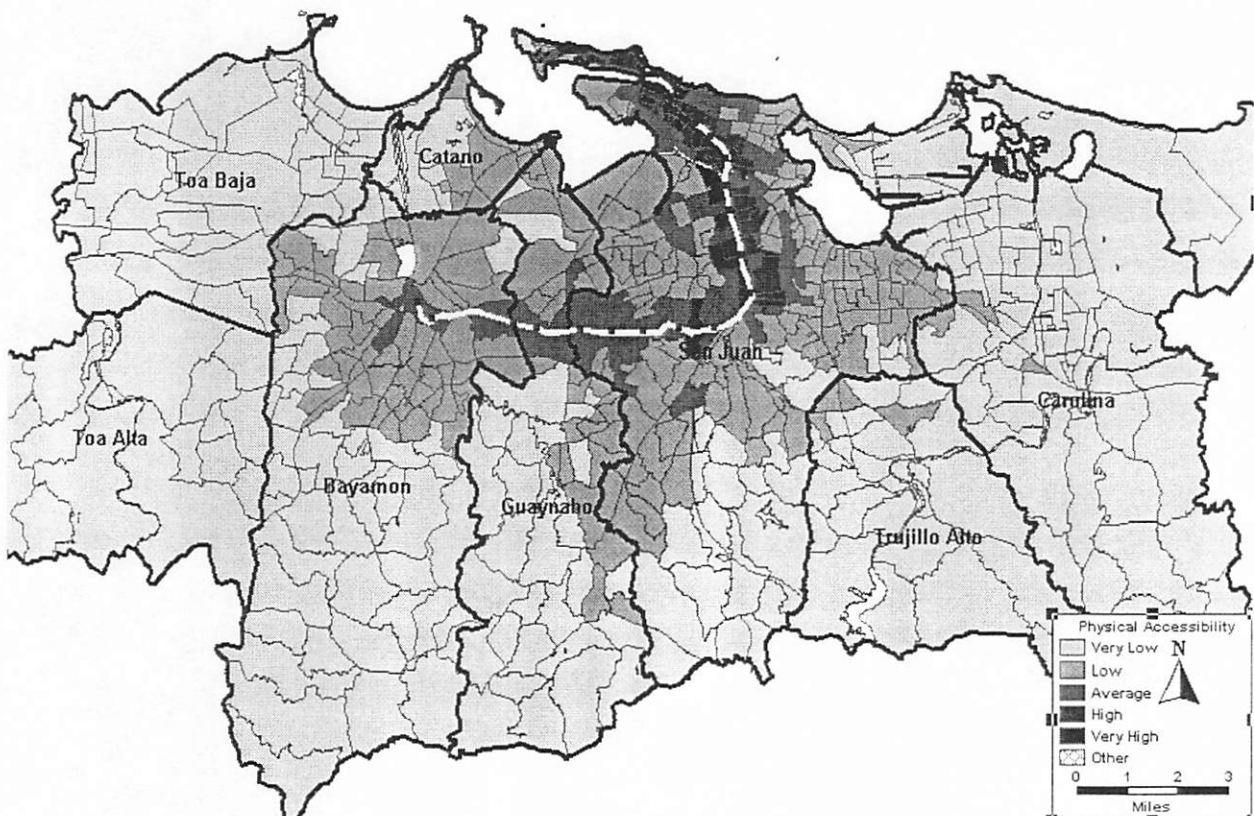


Fig. 4.19. San Juan: Change in Physical Accessibility as a Result of *Tren Urbano*

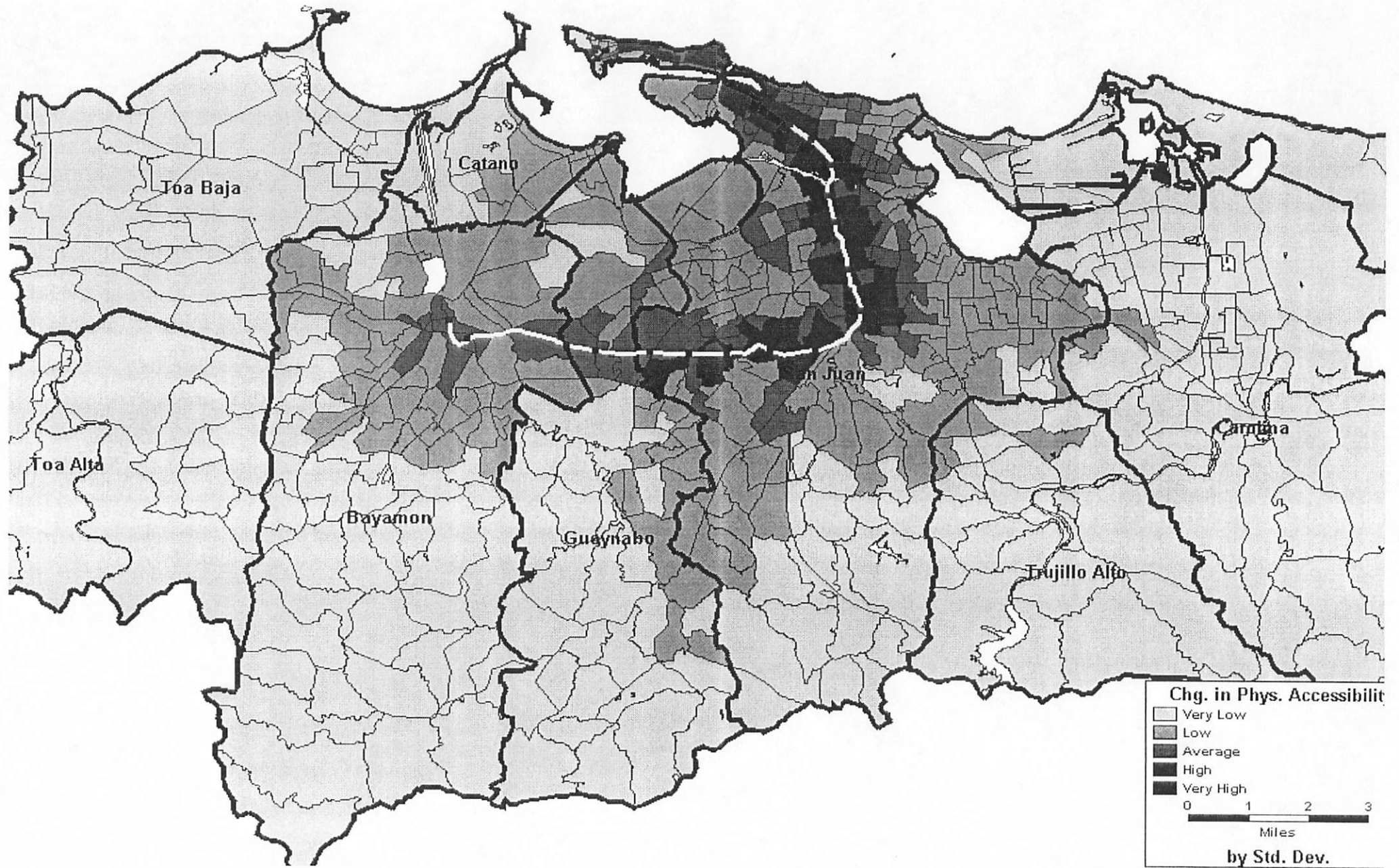


Figure 4.20. San Juan: Competitive Job Accessibility, "No Build"

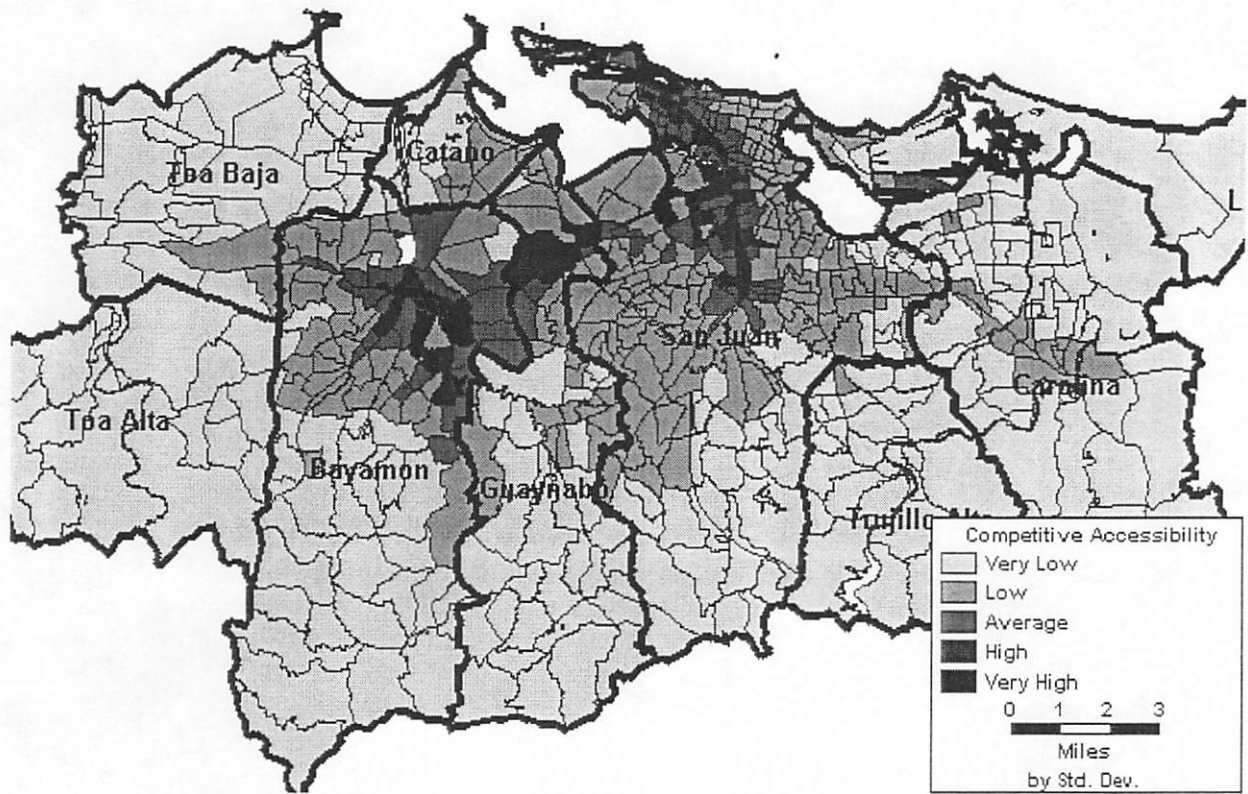


Figure 4.21. San Juan: Competitive Job Accessibility, "Build"

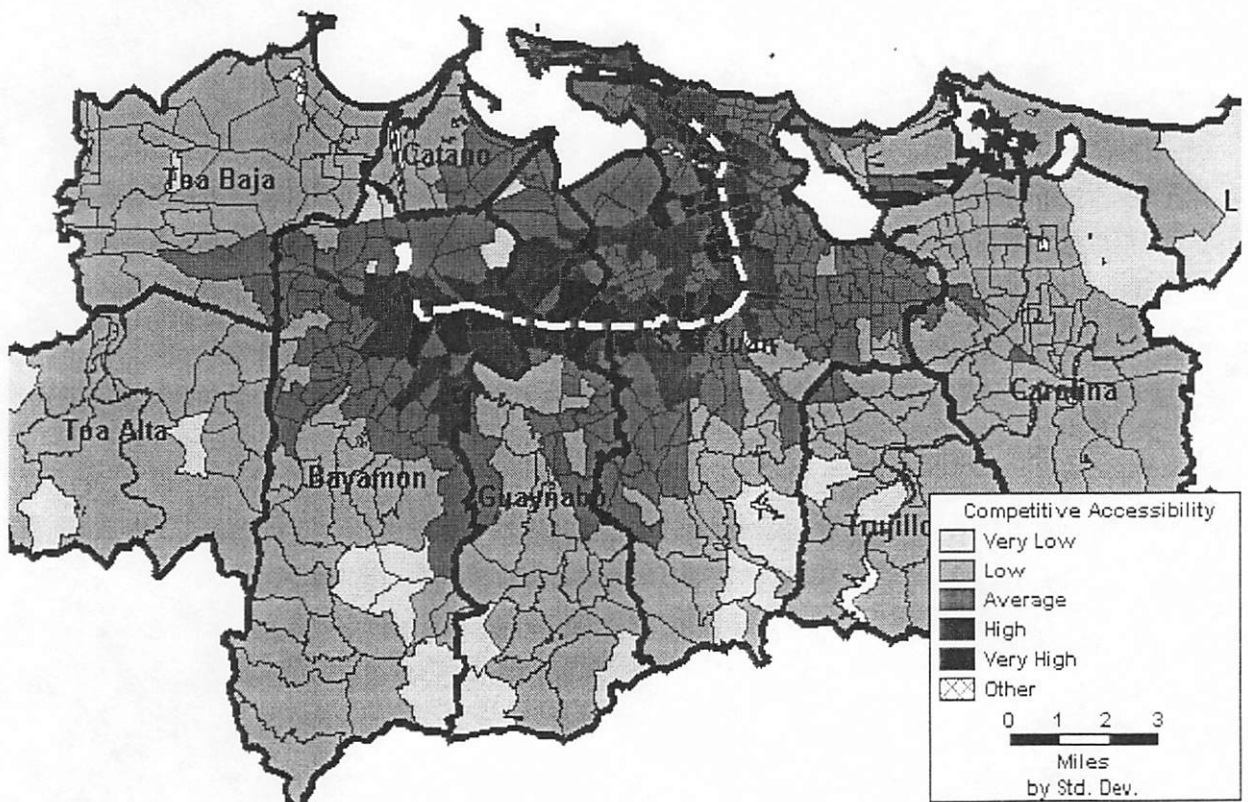
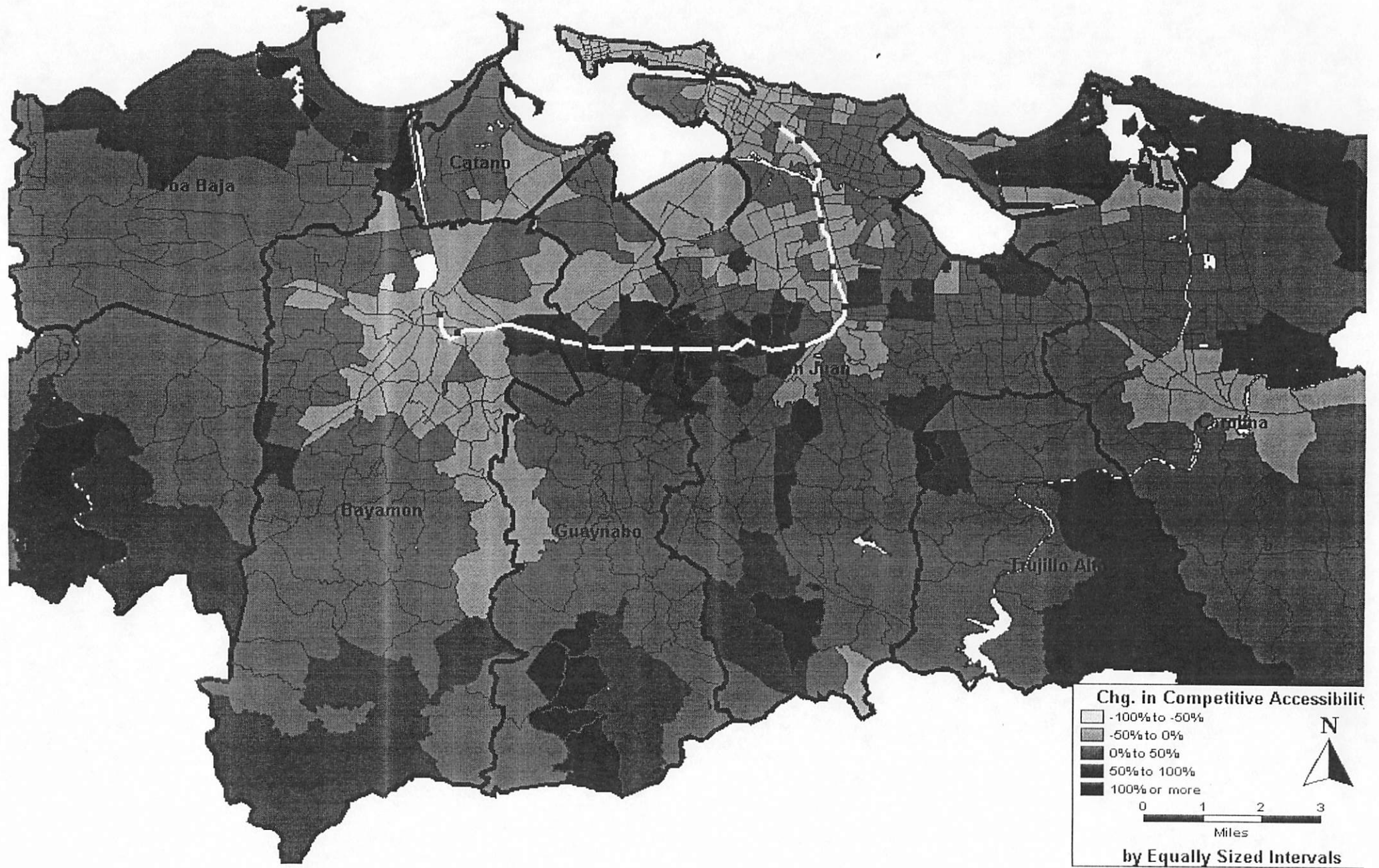


Fig. 4.22. San Juan: Change in Competitive Accessibility as a Result of *Tren Urbano*



Effects of *Tren Urbano* on Regional Job Accessibility

- *Tren Urbano* will improve *all* workers' physical job accessibility, though its distribution of benefits will be inherently uneven
- Low-income workers living near *Tren Urbano* stations will experience the greatest increases in physical job accessibility
- Low-income workers living near job centers will experience declines in their accessibility as a result of much greater competition for nearby jobs.
- Low-income workers living far from job centers will be able to access and compete for jobs much more effectively.

Transportation and Land Use Policies

Alternative Strategies:

1. Adjust/re-route existing AMA services.
2. Provide better access to the transit system.
3. Extend *Tren Urbano*: Carolina, Airport, Old San Juan.
4. Improve afternoon *publico* services.
5. Relocate recipients.

Figure 5.5. Key AMA Routes

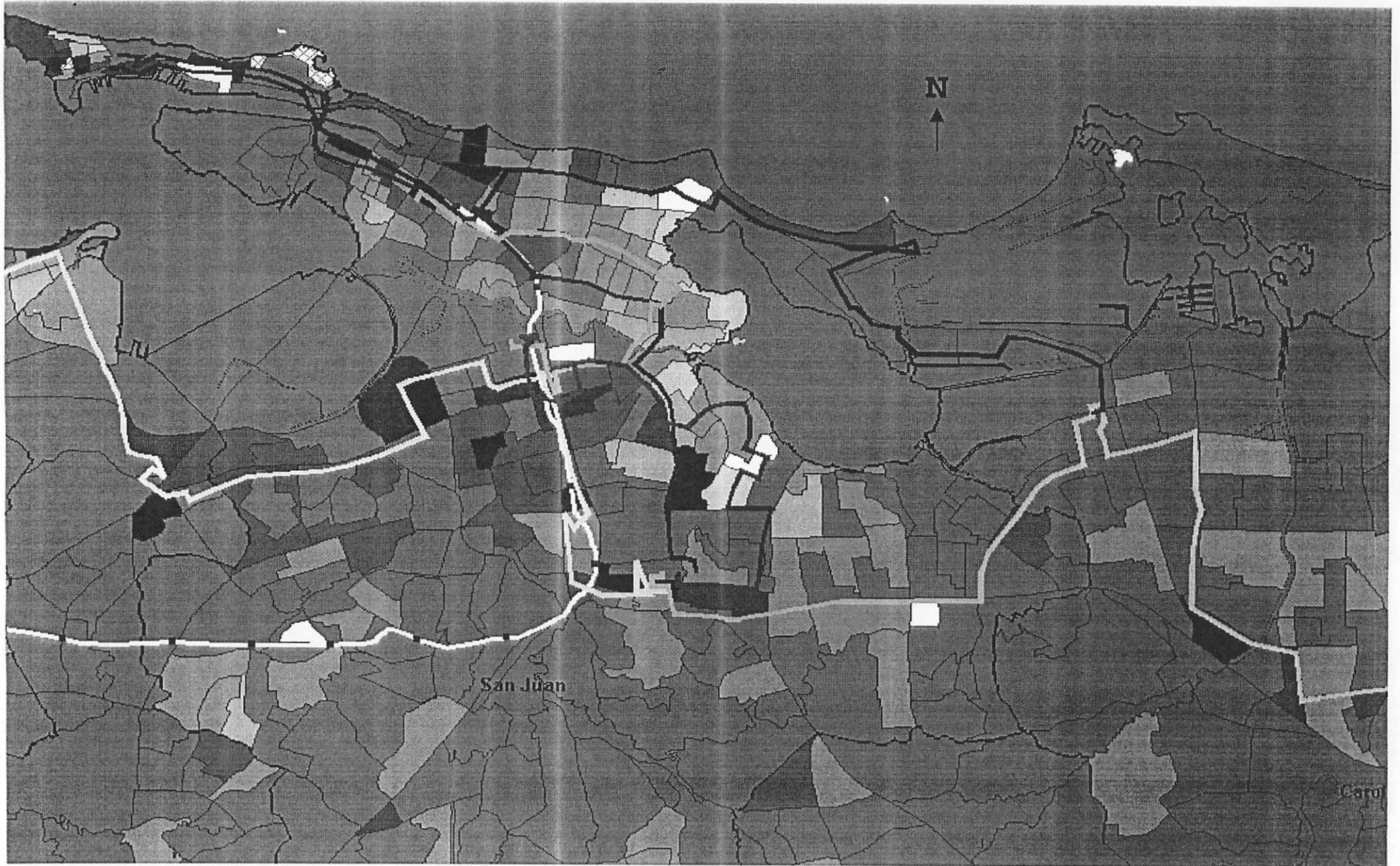
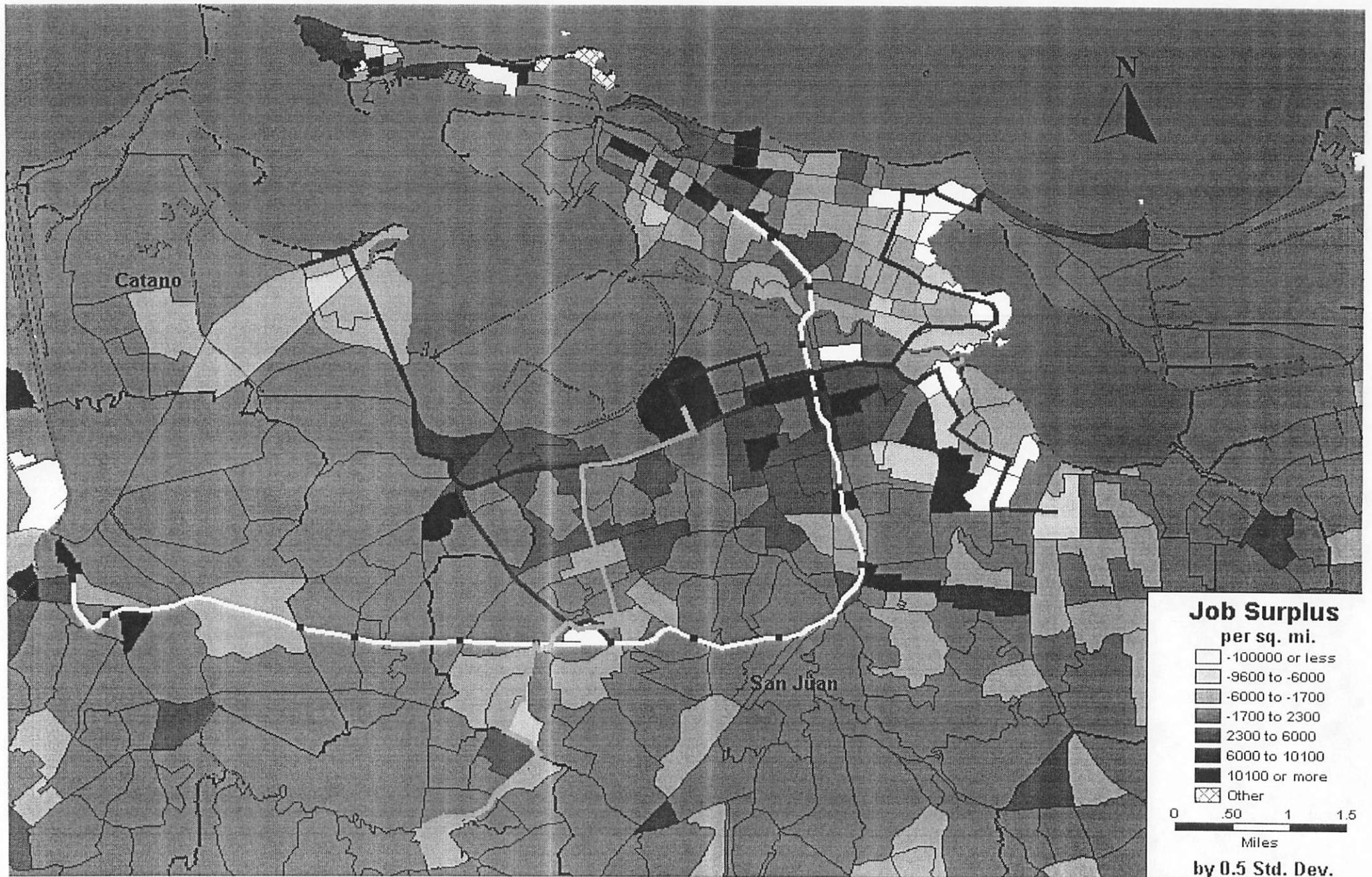


Table 5.4. Priority AMA Routes, and Recommended Adjustments to Them

Rte.	Significant Destinations	Weekday Psgrs. (Rank)	Daily Boardings/ Rev. Mi. (Rank)	Headway 1998	Multisystems T.U. Feeder Bus Plan		Recommendation
					Headway 2001	Planned 2001 Routing	
1	A3 Catano (recipients) to San Patricio (jobs) to Plaza Las Americas (recipients & jobs) to Hato Rey (jobs) to Rio Piedras (recipients & jobs)	7,080 (4)	6.2 (2)	15	10	No Change in route	Keep as planned
2	A9 Rio Piedras (recipients & jobs) through San Jose (jobs & recipients), through eastern Santurce (recipients) to Parada 18 (jobs), to Old San Juan (jobs & recipients)	12,455 (1)	8.8 (1)	10	8	Shorten route to operate between Rio Piedras and Isla Grande (convention center)	Restore route to Old San Juan; bypass Isla Grande
3	C11 Eastern Santurce (workers) to Hato Rey (jobs, transit)	1,144 (18)	3.7 (9)	30	20	No Change in route	Extend to Plaza Las Americas
4	B15 Rio Piedras (workers, jobs) through San Jose (workers), to Hato Rey (jobs)	1,462 (15)	2.9 (15)	20	15	Re-route via Pinero Expressway to UPR Station	Straighten the route through Hato Rey and extend it to Plaza Las Americas
5	A5 Old San Juan (jobs, recipients) to Parada 18 (jobs, workers), along Avenida Loiza (recipients) to Isla Verde (jobs), near airport (jobs) and to Iturregui	9,691 (2)	4.6 (4)	8	7	No Change in route	Keep as planned
6	A6 Carolina (recipients) to Plaza Carolina (jobs), through Avenida 65 de Infanteria corridor (recipients) to Rio Piedras (recipients, jobs)	6,882 (5)	5.5 (3)	12	5	Re-route to Iturregui Ave. and operate express to Centro Judicial Station via PR8 and Pinero Expressway. Replace with new Route 7 (Central Judicial to Carolina via PR3) and new Route 46 (Centro Judicial to Iturregui via PR3)	Re-route and replace as planned

Note: Routes are listed in order of priority, from 1 (highest) to 6.

Figure 5.7. Proposed AMA Routes



Alternatives...

2. Serve those recipients not presently served by transit.

- Existing services reach to within 1/2-mile of 87% of recipients.
- Of the recipients who are isolated from transit, 35% live in the western portion of Loiza.

3. Extend Tren Urbano: Carolina, Airport, Old San Juan.

Recipients and Entry-level Jobs Within 1/2-mile of TU Phases

	Welfare recipients	Entry-level Jobs
Phase 1	10.0%	28.6%
Old San Juan	2.6	18.6
Airport	8.4	12.8
Carolina	7.7	9.6
TOTAL	28.8%	69.6%

Figure 5.3. Routes That This Research Proposes to Extend into Loiza

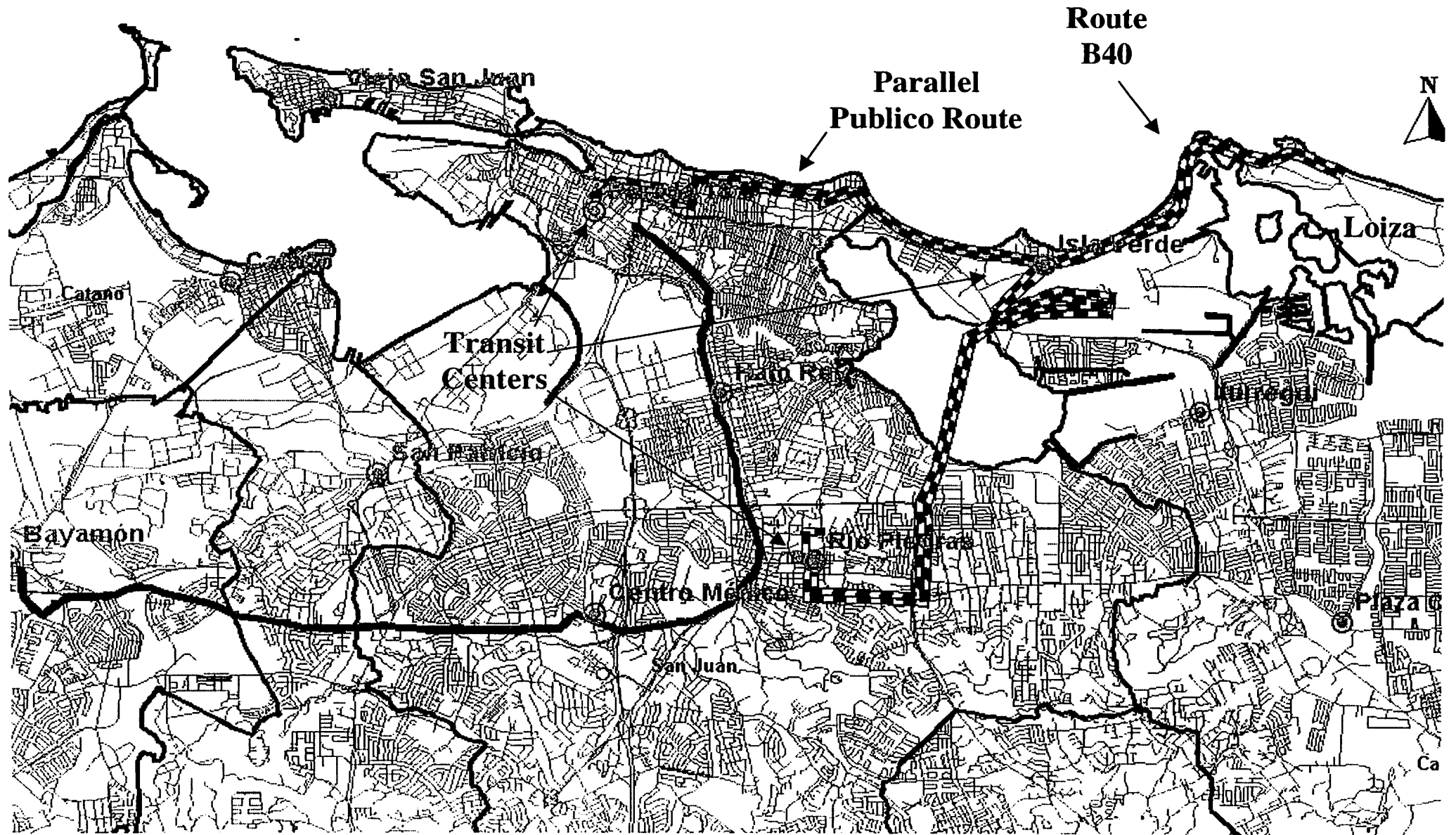
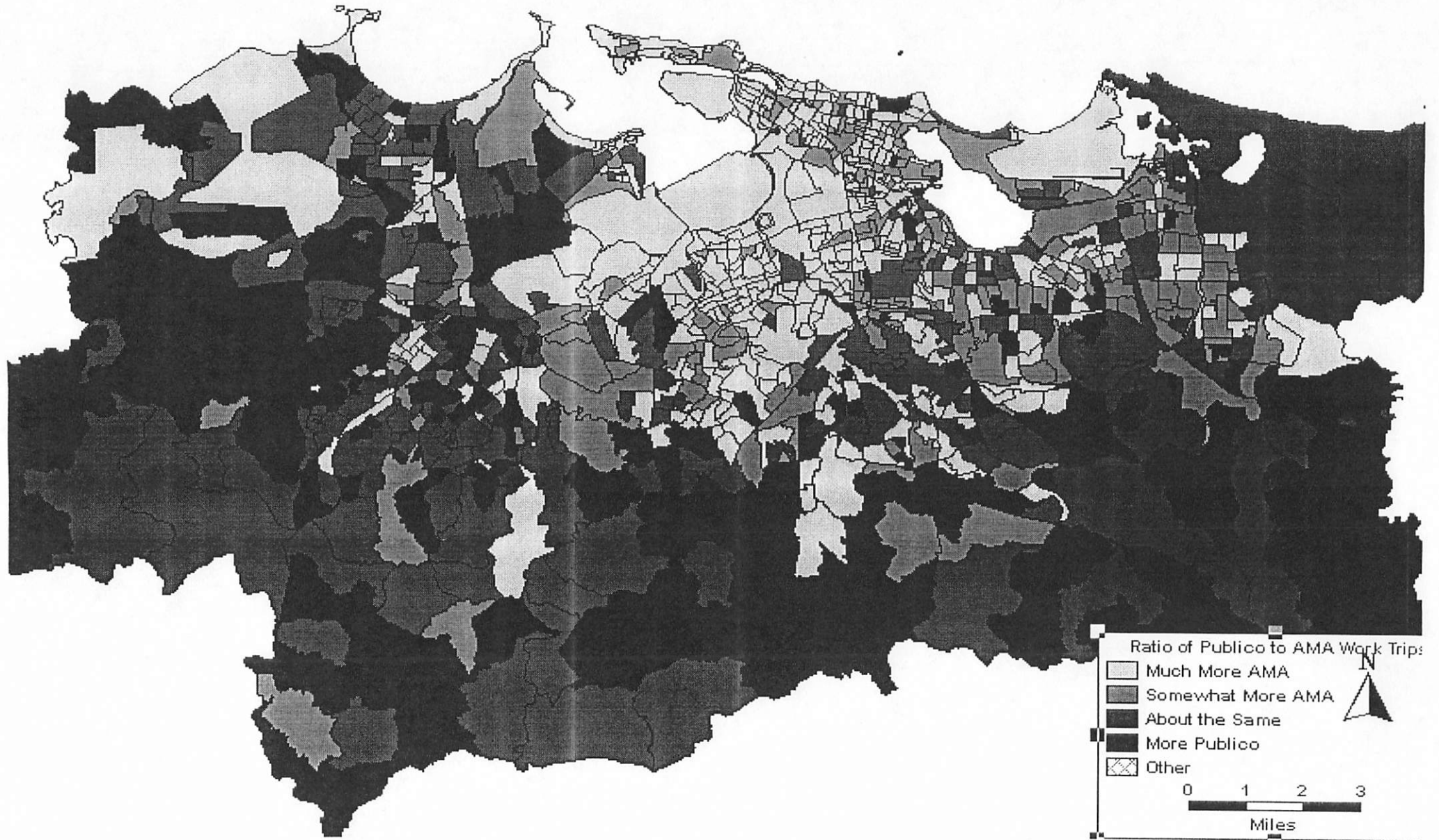


Figure 5.1/5.2. Work Trips by AMA or Publico in Metro San Juan



Relocation Policy

For welfare recipients relocating from outlying areas to *Tren Urbano* station areas:

- physical accessibility can increase by about 600%
- competitive accessibility can increase by about 500%

Strategies for promoting the policy:

- more affordable housing near *TU* stations
- Location Efficient Mortgages
- conglomerating destinations around *TU* stations
- information / promotion

Recommendations

- Extend Route B40 and parallel *publico* route into western Loiza
- Maintain the identified “key” AMA services, and make the recommended adjustments to Routes A9, C11 and B15.
- Develop a residential relocation program to *Tren Urbano* station areas.
- Prioritize extending *Tren Urbano* to the airport
- Improve afternoon *publico* services