



Combatting Sprawl with non-motorized transportation use, An analysis of walking and bicycling statistics



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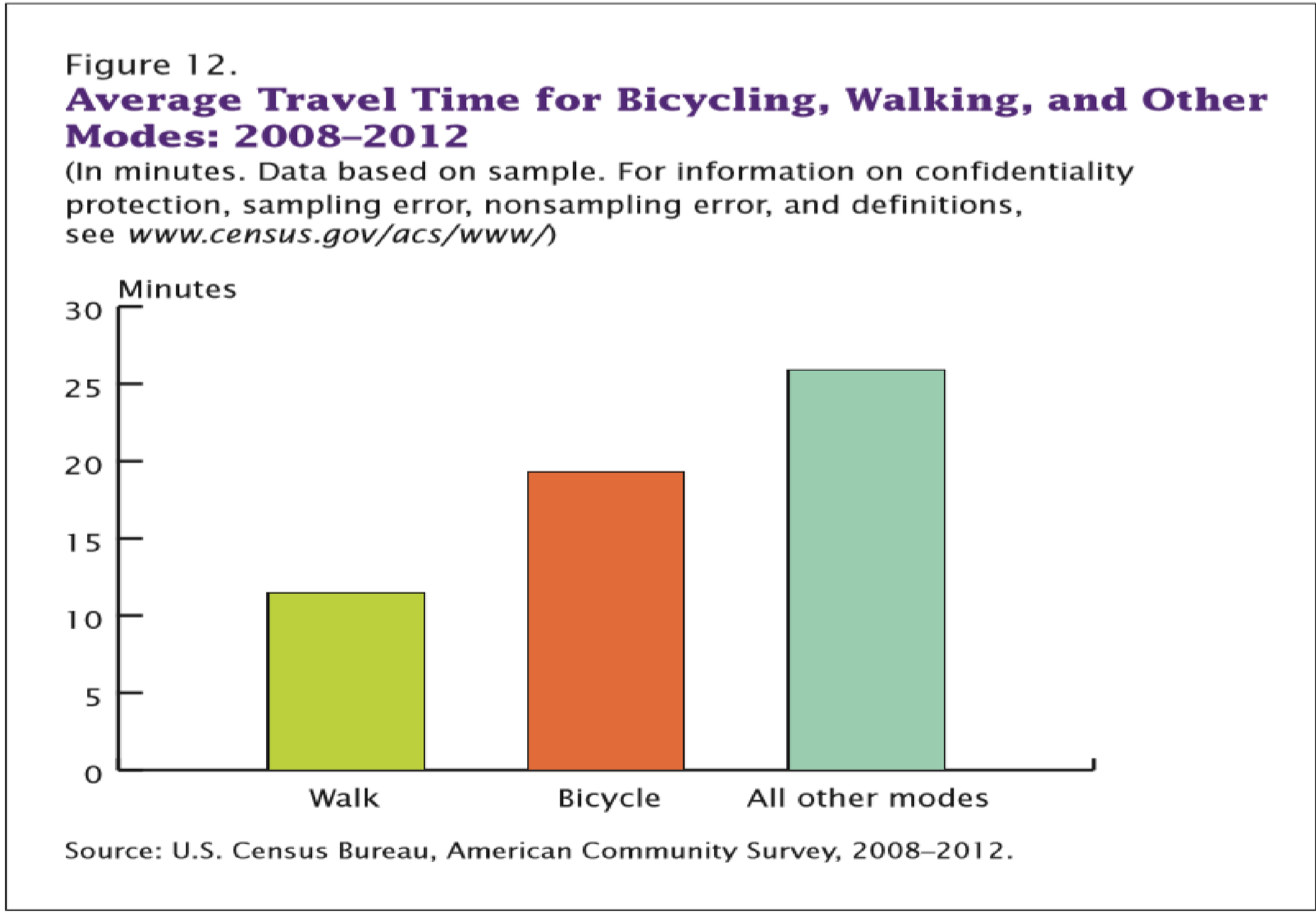
ABSTRACT

United States citizens are surrounded by a built environment that requires automobile use above all other transport modes. Utilizing alternative modes such as walking and bicycling are possible ways to combat the effects that urban sprawl has instilled on our nation. This study will determine the effects these transportation modes have on US urban areas. Census data was used to conduct statistical analysis on cities with like attributes.

BACKGROUND

Urban sprawl has consumed the United States since the 1950's. The conclusion of WWII produced a rush to suburbs across the country. The growth of the highway system accompanied by mass automobile manufacturing promoted migration away from urban centers.

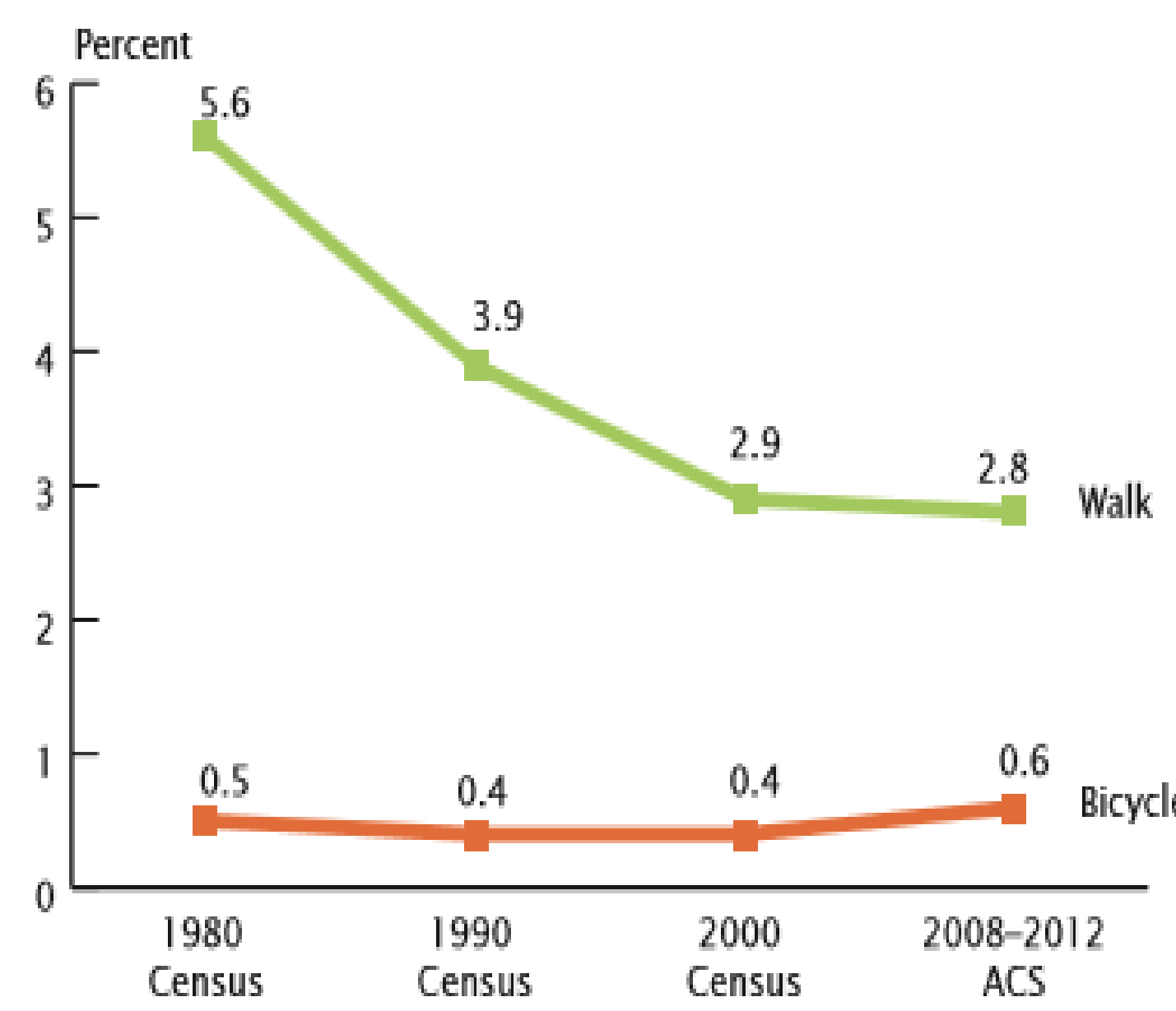
Incorporating non-motorized transportation into comprehensive plans has the potential to dampen the negative effects sprawl puts on our environment and national infrastructure. These effects include issues such as automobile dependency, environmental degradation, and a lack of public transportation.



The graph above shows commute times by transportation mode. With increased access to waling and biking, commute times would be similar amongst all modes. The outcome would be more interconnected cities, with the added benefit of increased physical activity.

Walking and Bicycling to Work: 1980 to 2008-2012

(Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see www.census.gov/acs/www/)



Sources: U.S. Census Bureau, Decennial Census, 1980, 1990, 2000; American Community Survey, 2008-2012.

AIM OF STUDY

Main objectives are as follows:

- Determine the effects non-motorized transportation has on sprawl
- Investigate the planning approach and implementation strategies across federal, state, and local planning commissions
- Investigate non-motorized transportation use in cities with like attributes.

METHODS

Using a difference of proportions z-test and survey results collected in Philadelphia PA, statistical analysis was conducted to determine the following:

- The effects non-motorized transportation has on cities
- If cities with like geographical attributes show similar statistical results

Median proportions
Of cities with similar
attributes were
used to calculate
difference of
proportions z-tests

Commuter data was
collected in Center
City to serve as our
claimed statistic

Respondent	Car	Bike	Walk
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City Name	Population	Bike%	Walk%	Drive%
1. New York City	8,143,197	.80	10.3	89.62
2. Los Angeles	3,844,829	1.0	3.7	96.20
3. Chicago	2,842,518	1.3	6.4	92.30
4. Houston	2,016,582	.40	2.1	97.50
5. Philadelphia	1,463,281	.20	8.6	89.40
6. Phoenix	1,461,575	.70	1.8	89.40
7. San Antonio	1,256,509	.20	2.0	97.80
8. San Diego	1,255,540	.90	2.9	96.20
9. Dallas	1,213,825	.10	1.8	97.20
Total Pop = 23,497,856		Median = .0075 (.75%)	Median = .025 (2.5%)	Median = .9620 (96.2%)

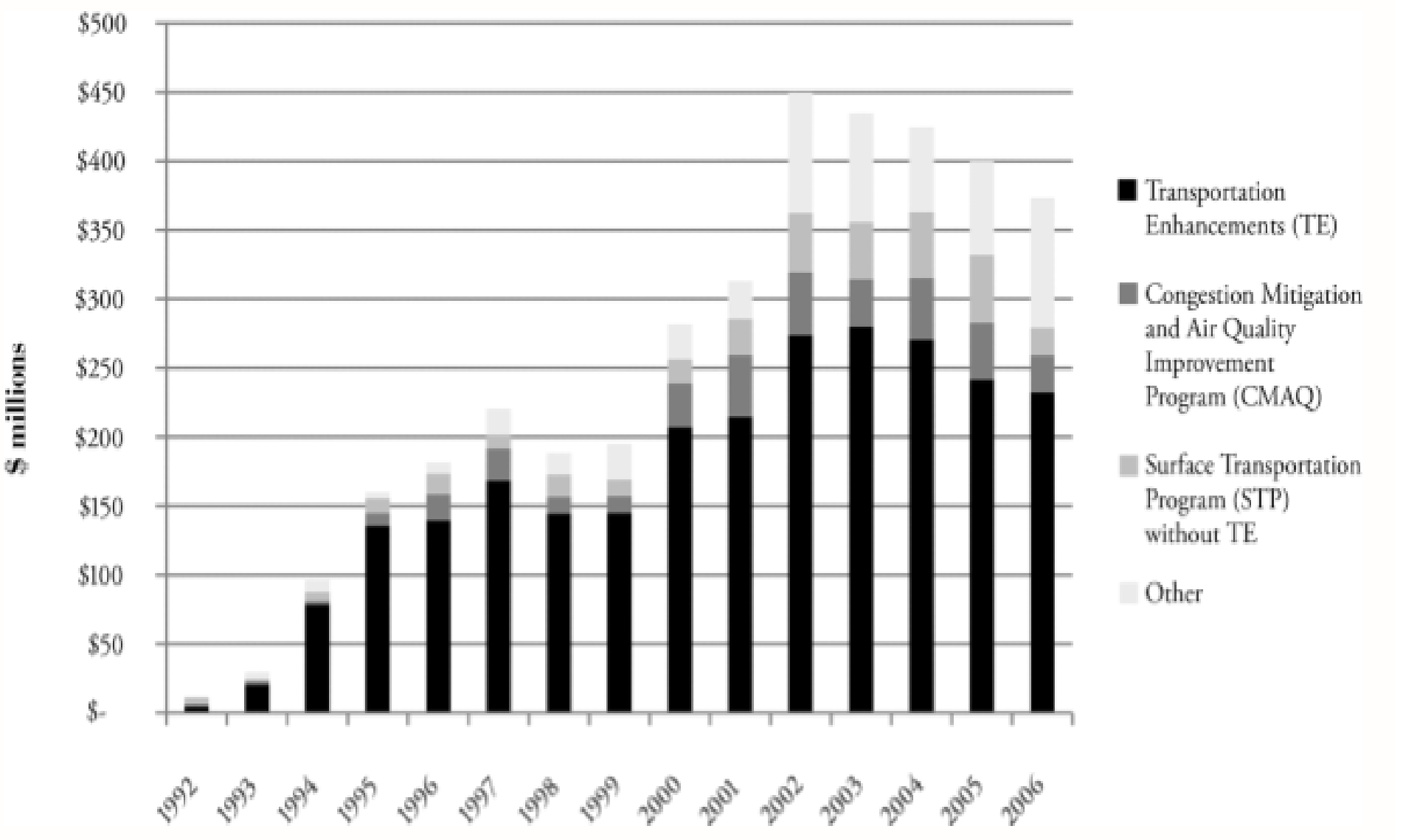
City Name	Land Area (sq. mi)	Bike	Walk	Drive
1. Mobile	139.11	.10	1.30	97.70
2. Detroit	138.75	.30	3.10	93.90
3. Chattanooga	137.15	.50	3.0	92.00
4. Las Vegas	135.82	.40	1.90	94.10
5. Mesa	135.45	1.6	.90	97.50
6. Philadelphia	134.10	2.0	8.60	89.40
7. Portland	133.43	6.1	5.7	88.20
8. Atlanta	133.15	.80	4.7	94.50
9. Winston-Salem	132.45	.20	2.2	97.60
10. Brownsville	132.33	.10	2.2	97.30
11. Columbia	132.21	.50	11.3	88.20
Total Land Area = 1,483.95		Median = .0045 (.45%)	Median = .026 (2.6%)	Median = .9430 (94.3%)

City Name	Population Density (sq. mi)	Bike	Walk	Drive
1. Santa Ana	11,900.6	1.1	2.2	96.70
2. El Monte	11,867.3	1.1	3.0	95.90
3. Chicago	11,841.8	1.3	6.4	92.30
4. Miami Beach	11,510.5	5.1	13.3	81.60
5. Newark	11,458.2	.20	8.0	91.80
6. Philadelphia	11,379.5	2.0	8.6	89.40
7. Yonkers	10,880.3	0.0	5.2	94.80
8. Norwalk	10,873.5	.50	2.1	97.40
9. Berkeley	10,752.6	8.1	17.0	74.90
10. Hialeah	10,474.1	.10	.50	99.40
11. Elizabeth	10,144.4	.40	6.8	92.80
		Median = .008 (.8%)	Median = .056 (5.6%)	Median = .9380 (93.8%)

RESULTS

Upon completion of the testing method, the following was recorded:

- 8 out of 9 tests returned no significant findings to statistically support the notion that non-motorized transportation helps alleviate sprawl.
- Cities with similar geographical attributes still have too much variability due to government fragmentation and planning policy
- The 31 cities used in the study had similar characteristics to Philadelphia, but lacked a notable correlation across all commute modes.
- Federal funding for surface transportation is not substantial enough to create immediate visible impacts.



CONCLUSIONS

Our results show that non-motorized transportation is having little effect on alleviating sprawl in and around our cities. It will take some time to render current efforts successful. Access to alternative modes of transportation is an amenity that US citizens deserve. Planning urban areas with accessibility, mobility, and walkability is the future of America's urban landscape. In time, improvements will be made, but the combination of governmental fragmentation and varying approaches to city planning will play a significant role in the growth of non-motorized transportation. Local governments must continue to use the public opinion and visioning process to develop comprehensive plans that will actually take shape. Working with all stakeholders, planning commissions have the ability to adapt to the changing lifestyles of many Americans.

Non-motorized transportation use has the potential to condense our suburbanized nation, but no significant solutions have been incorporated in a manner that will point America in the right direction.