3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

The Tragedy of the Unmet Demand for Walking and Biking

Arthur C. Nelson, Gail Meakins, Deanne Weber, Shyam Kannan, and Reid Ewing*

WITH GROWING CONCERNS ABOUT GLOBAL CLIMATE CHANGE AND RISING GASOLINE PRICES, there is increasing interest in expanding opportunities for people to walk or bike to key destinations. Global climate change will raise the sea level by one-half to one meter or more by 2100 and alter climatic conditions in most of the world.[1] These changes will displace tens to hundreds of millions of people.[2] There is scientific consensus that climate change is induced mostly by increasing carbon loads in the atmosphere and this in turn is caused substantially by the burning of fossil fuels in motorized vehicles.[3]

Between 2010 and 2035, the global demand for fossil fuels is projected to nearly double.[4] In light of increasing global demand, energy prices would seem poised to rise as well. For instance, between 2002 and 2011, U.S. gasoline prices rose more than nine percent annually,

*Arthur C. Nelson, Metropolitan Research Center, University of Utah; Gail Meakins, Metropolitan Research Center, University of Utah; Deanne Weber, Porter-Novelli; Shyam Kannan, RCLCo; Reid Ewing, Metropolitan Research Center, University of Utah. The authors acknowledge the US Department of Housing and Urban Development's Sustainable Communities Research Grant program and the National Institute for Transportation and Communities for supporting research leading to this article. Views expressed herein are ours and not necessarily those of our sponsors.

1. Robert J. Nicholls et al., *Coastal Systems and Low-Lying Areas, in* CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY, CONTRIBUTION OF WORKING GROUP II TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 315-356 (M.L. Perry et al. eds., 2007), *available at* http://www.ipcc-wg2.org/index.html.

2. *See* MANAGING THE RISKS OF EXTREME EVENTS AND DISASTERS TO ADVANCE CLIMATE CHANGE ADAPTATION 247-48, INTERGOVERNMENTAL PANEL ON CLIMATE Change (2012). About 50 million Europeans are at risk from sea-level rise associated with climate change. By extension, I estimate at least half that number of Americans may be at risk.

3. *See generally* REID EWING ET AL., URBAN LAND INSTITUTE, GROWING COOLER: THE EVIDENCE ON URBAN DEVELOPMENT AND CLIMATE CHANGE (2007).

4. U.S. ENERGY INFORMATION ADMINISTRATION, INTERNATIONAL ENERGY OUTLOOK 2010 (July 2010), http://large.stanford.edu/courses/2010/ph240/riley2/docs/EIA-0484-2010.pdf.

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

compounded, or more than three times faster than inflation.[5] If sustained, this implies eight-dollar-per-gallon gasoline prices by 2020.

Among the mobility alternatives to carbon-based mobility are walking and biking. Generally, there has been a trend since 1995 for more walking and biking trips though the overall share of all trips is small. Tables 1 and 2 show the change in share over the period 1995 to 2009 of all trips and person miles by trip mode for all trip purposes, work trips (to "earn a living" according to the National Household Travel Survey), and errand trips (for "family/personal business" according to the NHTS). Table 3 reports average person miles traveled for all trips and trips for work and errands. Indeed, while overall shares are small, the share of trips made by walking or bicycling for work and

Table 1: Change in Mode for All Trips, Work Trips, and Errand* Trips, 1995-2009

Mode and Purpose	1995	2001	2009	Change 1995-2009	Percent Change 1995-2009
All Trips	378,930	384,485	392,023	13,092	3.5%
All Walk/Bike Trips (millions)	23,667	36,358	45,044	21,377	90.3%
All Trips to Work (millions)	76,761	72,356	73,157	(3,604)	-4.7%
Non-Bike/Walk Trips to Work (millions)	74,713	69,886	70,103	(4,610)	
Walk/Bike Trips to Work (millions)	2,048	2,470	3,054	1,006	
Walk/Bike Trips to Work, Share	2.7%	3.4%	4.2%		56.5%
All Trips for Errands (millions)	173,764	168,579	166,535	(7,229)	-4.2%
Non-Bike/Walk Trips for Errands (millions)	164,259	156,160	150,619	(13,640)	
Walk/Bike Trips for Errands (millions)	9,505	12,419	15,916	6,411	
Walk/Bike Trips for Errands, Share	5.5%	7.4%	9.6%		74.7%

5. U.S. ENERGY INFORMATION ADMINISTRATION, SHORT-TERM ENERGY OUTLOOK—REAL ENERGY PRICES (2011), *available at* http://www.eia.gov/EMEU/steo/realprices/index.cfm.

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

Table 2: Change in Mode for All Trip Person Miles, Work Trip Person Miles, and Errand Trip Person Miles, 1995-2009

Person Miles and Purpose	1995	2001	2009	Change 1995-2009	Percent Change 1995-2009
All Miles	3,411,122	3,783,979	3,732,791	321,669	9.4%
All Walk/Bike Miles (millions)	15,407	29,684	36,900	21,493	139.5%
All Miles to Work (millions)	962,872	883,049	862,208	(100,664)	-10.5%
Non-Bike/Walk Miles to Work (millions)	960,758	880,482	857,867	(102,891)	
Walk/Bike Miles to Work (millions)	2,115	2,567	4,341	2,227	
Walk/Bike Miles to Work, Share	0.2%	0.3%	0.5%		129.3%
All Miles for Errands (millions)	1,191,789	1,241,887	1,103,161	(88,628)	-7.4%
Non-Bike/Walk Miles for Errands (millions)	1,186,886	1,234,489	1,094,281	(92,605)	
Walk/Bike Miles for Errands (millions)	4,902	7,398	8,880	3,977	
Walk/Bike Miles for Errands, Share	0.4%	0.6%	0.8%		95.7%

errands increased by 56% and 75% between 1995 and 2009 respectively. In contrast, the number of all work and errand trips fell. Indeed, errand trips via walking/biking increased by nearly the amount that errand trips for all other modes fell. However, the mean distance for the walk/bike mode to work is less than one mile while for errands it is about one-half mile.[6]

These observations beg the question: Does a sizeable number of Americans want to walk or bike to work and for errands? If so, to what extent are their preferences being met?

6. These figures, and the data in Tables 1-3, were calculated from data provided by the U.S. DEP'T OF TRANSP., NAT'L HOUSEHOLD TRAVEL SURVEY, DATA EXTRACTION TOOL (2011), http://nhts.ornl.gov/det/Extraction4.aspx (last visited June 1, 2013) [hereinafter NHTS].

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

Table 3: Change in Person Miles per Trip for All Trips, Work Trips and Errand Trips, 1995-2009

Person Miles Per Trip by Purpose	1995	2001	2009	Change 1995-2009	Percent Change 1995-2009
All Trips	9.00	9.84	9.52	0.52	5.8%
All Walk/Bike Trips	0.65	0.82	0.82	0.17	25.8%
All Trips to Work	12.54	12.20	11.79	-0.76	-6.0%
Non-Bike/Walk Trips to Work	12.86	12.60	12.24	-1.15	
Walk/Bike Trips to Work	1.03	1.04	1.42	0.39	
Walk/Bike Trips to Work, Share	0.08	0.09	0.12		46.5%
All Trips for Errands	6.86	7.37	6.62	-0.23	-3.4%
Non-Bike/Walk Trips for Errands	7.23	7.91	7.27	-0.28	
Walk/Bike Trips for Errands	0.52	0.60	0.56	0.04	
Walk/Bike Trips for Errands, Share	0.08	0.08	0.08		12.0%

I. The Data

To answer this question, we acquired a proprietary dataset from Porter Novelli, a global public relations firm.[7] Annually, Porter Novelli conducts consumer research to track a variety of information about lifestyles and health behaviors. In 2003 and 2005, the surveys from which Porter Novelli derived the dataset were conducted via mail using Synovate's Consumer Opinion Panel. Response rates were 59% in 2003 and 80% in 2005.[8] Respondents were given small incentives (worth less than five dollars) for their participation. They were not required to participate and no personal identifiers are provided with the dataset. Data were post-weighted by gender, age, income, race, and household size to reflect the demographic proportions in the U.S. Census Current Population Survey for each year.

In the 2003 and 2005 surveys, Porter Novelli gauged market preferences for a variety of "smart growth" attributes including, for our purposes, the extent to which people believe it is important or very important to be able to walk or bike to work and shopping.[9] The surveys are quite large, with 5,873 respondents in 2003 and 4,943 respondents in

7. *See* PORTER NOVELLI, http://www.porternovelli.com/about (last visited June 1, 2013). We used their data with permission.
8. *Id.*
9. *Id.*

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

2005.[10] By contrast, other surveys we use range in sample size from about 1,000 to about 2,000. Because Porter Novelli asked the same questions in those years, our total sample size is 10,816.[11] Given this large sample size, we are able to parse respondents based on a number of key demographic indicators such as age, income, and household composition.

We are drawn to the Porter Novelli surveys because of two key questions both surveys asked, based on a scale of one ("not at all important") to five ("very important"), "how personally important is it to you to:"

Be able to walk or bike to work?
Be able to walk or bike to shopping?[12]

"Shopping" in the Porter Novelli survey is less inclusive than the term "family/personal business" used in the NHTS survey, so, because the term "errands" as used by the NHTS includes shopping and many other non-work related trips, the results will under-estimate preference for being able to walk or bike to errands.

II. Methodology

We want to assess future housing demand based on consumer preference for different walking and biking purposes. We are interested in estimating this demand for 2040 and comparing it to 2005 (the second survey year), thereby getting some sense of the magnitude of change needed to occur between now and 2040 to meet future market demands. Because the future demographic make-up of the U.S. will be different from 2005, we need to decompose the Porter Novelli survey into demographic subgroups. Which ones and how many within each group is open to debate; however, we decided to keep the categories and the subgroups within each category few in number. One key reason is that we want our multipliers of demand to be reasonably transparent and usable to a broad range of interests such as metropolitan planning organizations, transportation planning and design entities, and others interested in having future transportation systems meet emerging market demands. Another reason for doing this is that, eventually, we want to estimate demand based on combinations of demographic characteristics, what market analysts call "market segments."

10. *Id.*
11. *Id.*
12. *Id.*

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

We will discuss this later as an element of our future work. We settled on dividing respondents by age, income, and household type.

For age, we divided respondents into four groups: 18-34, 35-54, 55-69, and 70+. We chose these groups for the following reasons. The age group 18-34 corresponds to a youthful population that is just starting out in life, building careers (including attending college), and starting families. Work by Myers and Ryu[13] suggests that by their early to middle 30s households slow dramatically in their propensity to relocate.[14] The people in the group 35 to 54 are established in their careers, enjoy early to mature child-raising, and have more-or-less settled into their communities. Myers and Ryu for instance show a constantly declining propensity to relocate from the middle 30s into the middle 50s.[15] For the most part, people in the age group 55 to 69 are empty-nesters at the peak of their earning power and the least likely to relocate among all the age groups. Unlike other analysts whose cut-off for seniors is 65 years, we use 70 years. The principal reason based on Myers' and Ryu's work that shows that after decades of relative stability in their home situation, the propensity to relocate increases substantially around age 70 and accelerates.[16] This is the time when empty-nesters down-size, sometimes several times before passing on.

We settled on three basic income levels: lower, middle and upper. Because we had data on respondents' income specific to each state, we assigned income categories based on HUD's state-level area median income (AMI) figures effective for the survey years, 2003 and 2005. We thus technically assign respondents to <80%-AMI for lower income, 80%-120% AMI for middle income, and >120% AMI for upper income.

Finally, we divide the population into households composed of single persons, and households with more than one person with and without children. This simple approach is similar to that used by Martha Farnsworth Riche, former Census Bureau director, in her work projecting demographic trends from 2000 to 2025.[17]

13. Dowell Myers & Sungho Ryu, *Aging Baby Boomers and the Generational Housing Bubble: Foresight and Mitigation of an Epic Transition,* 74 J. AM. PLAN. ASS'N 1, 1-17 (2007).
14. *Id.*
15. *Id.*
16. *Id.*
17. M.F. Riche, *How Changes in the Nation's Age and Household Structure Will Reshape Housing Demand in the 21st Century, in* ISSUE PAPERS ON DEMOGRAPHIC TRENDS IMPORTANT TO HOUSING, U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT 125-47 (Feb. 2003).

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

These of course are very general groupings of a complex population. Notably lacking is a category for race and ethnicity. Yet, because of its high degree of correlation, income captures this reasonably well.[18] We also note that by 2040 the share of people declaring themselves to be multi-race will be among the largest groups of minorities.[19] We traded off precision for simplicity; and a high level of predictive accuracy for central tendencies or trends. Besides, even with more than 10,000 cases, we cannot parse the population too much.

III. Results

In Table 4 we show the extent to which respondents think it is personally important or very important for them to be able to walk or bike to work; a little less than one quarter of American households believes so.[20] There also is not much variation by age. There is a large variation with respect to income, however, as 28% of lower income households find this opportunity to be important compared to just 16% for the upper income category.[21] At 28%, a larger share of single person households also finds it to be more important than households with or without children, at 20% and 22%, respectively.[22]

These numbers could seem small, after all, they show that more than three quarters of respondents do not believe that being able to walk or bike to work is important or very important. On the other hand, from Table 1 we know that fewer than 5% of all workers actually do walk or bike to work.[23] Thus, we see substantial upside potential in increasing this share based on apparent market preferences.

In Table 5, we see the extent to which respondents think it is personally important or very important for them to be able to walk or bike to shopping; a little more than one-fifth of American households believe so.[24] There are interesting variations. About one quarter of the population over 55 believes it is important or very important personally to be able to walk or bike to shopping; it is about one-fifth for the other age groups. As there was for the work question, there is a

18. *Id.*
19. *See generally id.* at 126.
20. *See* PORTER NOVELLI, *supra* note 7. The data upon which Table 4 is based is drawn from the Porter Novelli survey.
21. *Id.*
22. *Id.*
23. *See* NHTS, *supra* note 6 and Table 1 *infra.*
24. *See* PORTER NOVELLI, *supra* note 7, which is the basis for the data appearing in Table 5.

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

Table 4: How Personally Important Is It to ... Be Able To Walk or Bike to Work?

Demographic Group	Total	Important/Very Important
All	10,524	22.7%
Age	*10,524*	
18-34	3,379	23.9%
35-54	4,263	21.2%
55-69	1,872	23.2%
70+	1,010	24.2%
Income	*10,521*	
<80% AMI	5,353	27.9%
80%-120% AMI	2,147	19.0%
>120% AMI	3,021	16.2%
Household Type	*10,524*	
Single Person HH	2,708	27.7%
HH No Children	3,904	21.9%
HH With Children	3,912	20.1%

large variation with respect to income as 27% of lower income households find this opportunity to be important compared to just 16% for the upper income category. Among household types, 29% of single person households find it to be important to be able to walk or bike to shopping with the figures for households with or without children at 18% and 21%, respectively.[25]

We cannot compare these figures directly with those reported in Table 1, which reports trips for personal and family business. In any event, these numbers might seem small since nearly 80% of respondents do not believe that being able to walk or bike to shopping is important or very important. We also note, based on Table 1, that as many as 10% of those who want this option may already have it.[26] Still, it would seem that there is room to more than double the share of households being able to walk or bike to work based on this indicator of market demand.

25. *Id.*
26. *See generally* NHTS, *supra* note 6 and Table 1 *infra.*

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

Table 5: How Personally Important Is It to ... Be Able To Walk or Bike to Shopping?

Demographic Group	Total	Important/Very Important
All	10,629	22.0%
Age	*10,629*	
18-34	3,378	22.2%
35-54	4,278	20.2%
55-69	1,904	23.7%
70+	1,069	25.1%
Income	*10,626*	
<80% AMI	5,417	26.8%
80%-120% AMI	2,161	17.9%
>120% AMI	3,048	16.3%
Household Type	*10,629*	
Single Person HH	2,743	29.5%
HH No Children	3,969	20.5%
HH With Children	3,917	18.2%

IV. Application

There is a large gap between what Americans want in terms of walking and biking to work and errands, and what they get, as illustrated in Table 6.[27] Could it be that what people say they prefer varies from their behavior given the opportunity? We use the National Personal Transportation Survey of 1995 and the National Household Transportation Surveys of 2001[28] and 2009[29] to address this question. Those surveys provide information on the number of person trips and person miles traveled for work and errands by mode and by distance to those destinations.[30] We see in Table 3 that the mean trip length via walking/biking to work is a little less than a mile and for errands it is about one-half mile. To get a sense of how people choose non-motorized modes to work and for errands we need to look at short distances to those destinations. This is done in Table 7 which reports walking and biking trip

27. *See* PORTER NOVELLI, *supra* note 7, which is the basis for the data presented in Table 6.
28. *See* NHTS, *supra* note 6 (select year 2001).
29. *See* NHTS, *supra* note 6 (select year 2009).
30. *See* U.S. DEP'T OF TRANSP., FEDERAL HIGHWAY ADMIN., http://nhts.ornl.gov/det/ (last visited June 8, 2013).

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

Table 6: Supply and Demand for Walking/Biking to Work and for Errands

Mode and Destination	Supply	Demand
Walk or Bike to Work	4.2%	22.7%
Walk or Bike for Errands	9.6%	22.2%

modes for less than one mile, one to two mile, and three-to-five mile distances from work while Table 8 reports person miles traveled to work; Tables 9 and 10 provide similar information for errands. In all tables we report figures for 1995, 2001 and 2009, and show change in mode trip and miles share between 1995 and 2009.

For destinations less than a mile away in 2009, we see that about 37% of trips to work were via walking/biking (Table 7) and for errands it was about 42% (Table 9). These shares are up from 25% and 26% respectively in 1995, with an overall increase respectively of 45% and 61% over the period 1995 through 2009. The figures drop off considerably at one-to-two miles—by three quarters for work trips and about seven-eighths for errands. Beyond three miles, walk/bike trips to work and for errands fall below the overall means shown in Table 1. We see similar trends for person miles traveled for walking and biking to work and for errands.

We also note that the walk and bike modes gained in trips and person miles traveled to work and for errands within two miles of destinations, where all other modes fell. Indeed, for the most part, the increase in walk/bike trips was greater than the decrease in all other modes.

We arrive at two generalizations. First, surveys indicate that about 25% of Americans find being able to walk and bike to work, and for errands, is important to very important to them.[31] Second, in 2009, when work and errand destinations are within about a mile, about 35% and 40% walk and bike to work and for errands, respectively.[32] Indeed, the share has been increasing since 1995, when it was 24% and 25%, respectively.[33]

31. *See* NHTS, *supra* note 6; *see also* PORTER NOVELLI, *supra* note 7.
32. *See* NHTS, *supra* note 6.
33. *See* NHTS, *supra* note 6.

Table 7: Change in Share of Walk and Bike Work Trips Compared to All Work Trips, 1995-2009

Year	Walk to Work Less than 1 Mile	Walk to Work 1-2 Miles	Walk to Work 3-5 Miles	Bike to Work Less than 1 Mile	Bike to Work 1-2 Miles	Bike to Work 3-5 Miles	Walk/Bike to Work Less than 1 Mile	Walk/Bike to Work 1-2 Miles	Walk/Bike to Work 3-5 Miles
1995	23.9%	4.1%	1.0%	1.3%	1.1%	0.5%	25.3%	5.2%	1.5%
2001	32.2%	6.8%	1.1%	1.8%	0.7%	0.6%	34.0%	7.5%	1.6%
2009	35.1%	7.1%	1.0%	1.5%	1.5%	1.5%	36.7%	8.7%	2.4%
Change 1995-2009	46.7%	74.2%	-6.2%	15.7%	34.6%	194.6%	45.1%	65.6%	59.4%
Walk/Bike Trip Change (millions)a	551	120	(30)	9	11	139	559	132	110
All Trip Change (millions)b	(187)	(732)	(1,931)	(187)	(732)	(1,931)	(187)	(732)	(1,931)
Non-Bike/Walk Trip Change (millions)c	(738)	(853)	(1,902)	(196)	(743)	(2,070)	(746)	(864)	(2,041)

a. Change in work trips by walk or bike mode between 1995 and 2009 in millions.
b. Change in all work trips between 1995 and 2009 in millions.
c. Change in non-walk/bike work trips between 1995 and 2009 in millions.

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615-630] Date: [October 16, 2013] Time: [10:55]

3058-184-03Nelsonetal-Ipass-r03.3d Pages: [615-630] Date: [October 16, 2013] Time: [10:55]

Table 8: Change in Share of Walk and Bike Work Trip Person Miles Compared to All Work Trip Person Miles, 1995-2009

Year	Walk to Work Less than 1 Mile	Walk to Work 1-2 Miles	Walk to Work 3-5 Miles	Bike to Work Less than 1 Mile	Bike to Work 1-2 Miles	Bike to Work 3-5 Miles	Walk/Bike to Work Less than 1 Mile	Walk/ Bike to Work 1-2 Miles	Walk/ Bike to Work 3-5 Miles
1995	19.0%	4.3%	0.9%	1.4%	1.1%	0.4%	20.4%	5.4%	1.3%
2001	28.0%	7.0%	0.9%	2.2%	0.7%	0.5%	30.2%	7.7%	1.4%
2009	31.1%	7.5%	0.8%	1.8%	1.7%	1.3%	32.8%	9.2%	2.1%
Change 1995-2009	63.6%	73.3%	-9.7%	26.1%	53.2%	192.3%	61.1%	69.2%	59.4%
Walk/Bike Work Trip Person Miles Change (millions)	307	139	(75)	10	24	366	317	163	291
All Person Work Trip Person Miles Change (millions)	99	(583)	(4,393)	99	(583)	(4,393)	99	(583)	(4,393)
Non-Bike/Walk Work Trip Person Miles Change (millions)	(208)	(722)	(4,317)	89	(607)	(4,759)	(218)	(746)	(4,684)

a. Change in work trip person miles by walk or bike mode between 1995 and 2009 in millions.
b. Change in all work trip person miles between 1995 and 2009 in millions.
c. Change in non-walk/bike work trip person miles between 1995 and 2009 in millions.

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

Table 9: Change in Share of Walk and Bike Errand Trips Compared to All Errand Trips, 1995-2009

Year	Walk to Errands Less than 1 Mile	Walk to Errands 1-2 Miles	Walk to Errands 3-5 Miles	Bike to Errands Less than 1 Mile	Bike to Errands 1-2 Miles	Bike to Errands 3-5 Miles	Walk/Bike to Errands Less than 1 Mile	Walk/Bike to Errands 1-2 Miles	Walk/Bike to Errands 3-5 Miles
1995	24.8%	2.9%	0.6%	1.3%	0.7%	0.3%	26.1%	3.7%	0.9%
2001	34.4%	5.1%	1.1%	0.9%	0.4%	0.2%	35.4%	5.4%	1.3%
2009	40.4%	6.7%	1.1%	1.1%	0.8%	0.3%	41.6%	7.5%	1.5%
Change 1995-2009	62.8%	130.6%	75.1%	-11.1%	7.3%	35.1%	59.1%	105.8%	63.5%
Walk/Bike Trip Change (millions)a	5,014	810	216	(39)	4	37	4,975	814	254
All Trip Change (millions)b	410	(1,078)	(2,805)	410	(1,078)	(2,805)	410	(1,078)	(2,805)
Non-Bike/ Walk Trip Change (millions)c	(4,604)	(1,888)	(3,021)	450	(1,082)	(2,842)	(4,565)	(1,892)	(3,058)

a. Change in errand trips by walk or bike mode between 1995 and 2009 in millions.
b. Change in all errand trips between 1995 and 2009 in millions.
c. Change in non-walk/bike errand trips between 1995 and 2009 in millions.

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615-630] Date: [October 16, 2013] Time: [10:55]

Table 10: Change in Share of Walk and Bike Errand Trip Person Miles Compared to All Errand Trip Person Miles, 1995-2009

Year	Walk to Errands Less than 1 Mile	Walk to Errands 1-2 Miles	Walk to Errands 3-5 Miles	Bike to Errands Less than 1 Mile	Bike to Errands 1-2 Miles	Bike to Errands 3-5 Miles	Walk/Bike to Errands Less than 1 Mile	Walk/Bike to Errands 1-2 Miles	Walk/Bike to Errands 3-5 Miles
1995	19.1%	3.1%	0.5%	1.3%	0.7%	0.2%	20.4%	3.8%	0.8%
2001	30.9%	5.3%	0.9%	1.0%	0.4%	0.2%	31.8%	5.7%	1.1%
2009	34.9%	7.0%	1.0%	1.2%	0.8%	0.3%	36.1%	7.8%	1.3%
Change 1995-2009	82.6%	125.8%	79.8%	-6.1%	12.1%	40.0%	77.0%	103.9%	67.5%
Walk/Bike Trip Change (millions)a	2,140	894	556	(2)	19	118	2,138	913	674
All Trip Change (millions)b	636	(296)	(5,752)	636	(296)	(5,752)	636	(296)	(5,752)
Non-Bike/ Walk Trip Change (millions)c	(1,504)	(1,190)	(6,308)	638	(314)	(5,870)	(1,502)	(1,208)	(6,426)

a. Change in errand trip person miles by walk or bike mode between 1995 and 2009 in millions.
b. Change in all errand trip person miles between 1995 and 2009 in millions.
c. Change in non-walk/bike errand trip person miles between 1995 and 2009 in millions.

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

V. Implications

Changes seem to be afoot, and by cycle. The number of trips to work and for errands between 1995 and 2009 rose while the number of trips to work and for errands for all other modes of transportation fell during this same time.[34] In fact, the increase in walk/bike trips to work and for errands between 1995 and 2009 rivaled the fall in all other modes to those destinations.[35]

Moreover, when people are within about a mile of destinations for work and for errands, they are increasingly choosing the walk/bike mode over other modes. Between 1995 and 2009, the number of trips via all other modes to work fell by 746 million but increased by 559 million (see Table 7).[36] Within one-to-two miles, walk/bike trips to work increased by 132 million compared to a reduction of 864 million by all other modes.[37]

The differences are even more striking for errand trips. Between 1995 and 2009, the number of walk/bike trips for errands within one mile increased by nearly 5 billion while the number for all other modes fell by 4.6 billion as one can see in Table 9.[38] At one-to-two miles, walk/bike trips gained by 814 million while all other modes fell by 1.9 billion.[39]

Based on the Porter Novelli survey, about one quarter of Americans believe it is important to very important to be able to walk or bike to work and for errands.[40] From the NHTS, we find that more than one third actually chose the walk/bike option for these purposes if the destination is within one mile.[41] We also find that, in 2009, walk/bike trips and person miles account for about one quarter of all trips for work and for errands.[42] We surmise that about one quarter of Americans prefer to be within about two miles of work and errands—though of course three quarters do not or are ambivalent.

34. *See* NHTS, *supra* note 6.
35. *See* NHTS, *supra* note 6.
36. *See* Table 7; *see also* PORTER NOVELLI, *supra* note 7.
37. *See id.*
38. *See* Table 9; *see also* NHTS, *supra* note 6.
39. NHTS, *supra* note 6.
40. *See* PORTER NOVELLI, *supra* note 7.
41. NHTS, *supra* note 6.
42. NHTS, *supra* note 6.

3058-184-03Nelsonetal-1pass-r03.3d Pages: [615–630] Date: [October 16, 2013] Time: [10:55]

VI. The Tragedy

Let us take this proposition one step further. One quarter of Americans believe it is important to very important to be able to walk or bike to work or errands. When these destinations are within two miles, one quarter choose the walk/bike option to access them. Still, in 2009, fewer than 3% of Americans enjoyed this accessibility. One can only imagine the benefits if only the quarter of Americans who want the option to walk or bike to within two miles of work and errand destinations had the option.