

Next Stop – A Cleaner and Healthier Environment: Global Strategies to Promote Public Transit

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I. INTRODUCTION

Transportation demands and environmental concerns are inextricably linked.¹ The choices societies make to satisfy the fundamental need of transporting goods and people from one place to another impact energy consumption, air and water quality, public health and land use development patterns.² Cities and countries around the world have felt the multifaceted consequences that various transportation patterns have had on the environment, which include dangerous levels of air pollution, congested roads and voracious dependence on nonrenewable fuels.³

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1. See ROBERT J. SHAPIRO ET AL., CONSERVING ENERGY AND PRESERVING THE ENVIRONMENT: THE ROLE OF PUBLIC TRANSPORTATION 1, 5 (2002), available at <http://www.apta.com/research/info/online/documents/shapiro.pdf>.

2. See *Id.* at 1, 5, 8, 12; LINDA BAILEY, PUBLIC TRANSPORTATION AND PETROLEUM SAVINGS IN THE U.S.: REDUCING DEPENDENCE ON OIL 1 (2007), available at http://www.apta.com/research/info/online/documents/apta_public_transportation_fuel_savings_final_010807.pdf; LINDA BAILEY ET AL., THE BROADER CONNECTION BETWEEN PUBLIC TRANSPORTATION, ENERGY CONSERVATION AND GREENHOUSE GAS REDUCTION (2008), available at http://www.apta.com/research/info/online/documents/land_use.pdf.

3. See SHAPIRO ET AL., *supra* note 1 at 1, 5; DAVID SHRANK & TIM LOMAX, THE 2007 URBAN MOBILITY REPORT (2007), available at http://tti.tamu.edu/documents/mobility_report_2007_wappx.pdf.

The extensive environmental benefits of creating and expanding viable public transportation options are well-known. While China, India and the United States have all utilized a unique approach to the issues presented by current transportation and energy trends, each country has recognized the role public transit can play in addressing its pressing concerns.⁴ Beijing has used the hosting of the 2008 Summer Olympics as a unique opportunity to confront traffic congestion and air pollution by ambitiously expanding its subway system.⁵ In Delhi, the Supreme Court of India issued a series of orders over an almost two decade period that culminated in the conversion of all diesel-run vehicles to compressed natural gas (CNG).⁶ In the United States, where the federal government provides most of the funding for public transit investments, localities are presented with a competitive and rigorous review process for funding consideration.⁷ These strategies developed by the various policymakers in each country are distinct, but they have been implemented in response to universal needs, concerns and outcomes.

II. ENVIRONMENTAL BENEFITS OF PUBLIC TRANSPORTATION

From increasing property values through transit oriented development, revitalizing once neglected urban areas to generating new jobs, much attention has been devoted to the role public transportation can play in stimulating the economy.⁸ However, public transportation currently offers many significant environmental benefits that are often overlooked and under-appreciated. In fact, one comprehensive study notes that public transportation is the best current strategy for improving the

4. See generally Railway-Technology.com, *Beijing Subway Development*, http://www.railway-technology.com/projects/beijing_subway/ (last visited Oct. 4, 2008); see generally also DEV., CMTY., & ENV'T. DIV., U.S. ENVTL. PROT. AGENCY, EPA-231-R-01-002, *OUR BUILT AND NATURAL ENVIRONMENTS – A TECHNICAL REVIEW OF THE INTERACTIONS BETWEEN LAND USE, TRANSPORTATION, AND ENVIRONMENTAL QUALITY* (2001), available at <http://www.epa.gov/smartgrowth/pdf/built.pdf>; see generally also Khaiwal Ravindra et al., *Assessment of Air Quality After the Implementation of Compressed Natural Gas as Fuel in Public Transport in Delhi, India*, 115 ENVTL. MONITORING & ASSESSMENT 405 (Apr. 2006), available at <http://www.cleanairnet.org/caiasia/1412/article-60204.html>; see also Bernie Fischlowitz-Roberts, *Air Pollution Fatalities Now Exceed Traffic Fatalities by 3 to 1*, PUB. MGMT., Jan. 2003, at 33, available at <http://www.earth-policy.org/Updates/Update17.htm>.

5. See generally Railway-Technology.com, *supra* note 4; see generally also UrbanRail.net, *Beijing*, <http://www.urbanrail.net/as/beij/beijing.htm> (last visited Oct. 4, 2008).

6. Ravindra et al., *supra* note 4 at 1, 3.

7. See generally LINDA G. LUTHER, *STREAMLINING ENVIRONMENTAL REVIEWS OF HIGHWAY AND TRANSIT PROJECTS: ANALYSIS OF SAFETEA AND RECENT LEGISLATIVE ACTIVITIES* (2004), available at https://www.policyarchive.org/bitstream/handle/10207/1809/RL32032_20040602.pdf?sequence=1.

8. See generally INT'L ECONOMIC DEV. COUNCIL, *ECONOMIC DEVELOPMENT AND SMART GROWTH* (Alex Iams & Pearl Kaplan eds., 2006), available at http://www.iedconline.org/Downloads/Smart_Growth.pdf.

environment and promoting energy conservation without creating government programs or implementing new regulations upon the private sector.⁹

Using public transportation greatly reduces energy consumption of fossil fuels.¹⁰ In the United States alone, public transportation diminishes gasoline use by 1.4 billion gallons each year, which is the equivalent of 108 million fewer cars filling up or thirty-four supertanker deliveries of oil in a year.¹¹ There are many reasons for this sizeable decrease. First, public transportation carries a greater number of individuals than private automobiles do. While private automobiles transport 1.61 passengers per mile traveled, buses and trains transport sixteen.¹² Another reason for the reduced energy consumption is that public transportation utilizes more efficient sources of power than automobiles.¹³ Many buses and trains currently run on electricity, a hybrid of gasoline and electric or on environmentally friendly fuels such as compressed natural gas (CNG) or liquefied petroleum gas (LNG).¹⁴ As a result, private cars require almost twice the energy to carry one passenger a single mile than public transportation.¹⁵

Public transportation's ability to reduce congestion also lessens energy consumption. Traffic congestion only exacerbates the amount of gasoline used by an automobile. The Texas Transportation Institute found that travel delay caused by traffic alone resulted in 2.9 billion gallons of wasted fuel in 2005.¹⁶ Even a small increase in public transportation ridership can decrease automobile congestion, and concomitantly reduce fuel consumption. "A 5% reduction in peak-hour traffic volumes on a road at 90% capacity can reduce delay by 20% or more."¹⁷ The same effect hold true on surface streets as well.¹⁸ For a mental picture, consider the following. According to a USEPA study on smart growth, one full forty-foot bus is the equivalent of a six city-block swath of moving automobiles and one full six-car heavy rail train is equal to a ninety-

9. SHAPIRO ET AL., *supra* note 1 at 1, 2, 5.

10. BAILEY, *supra* note 2 at 1.

11. *Id.* A later study estimated the total energy savings due to public transportation to be 4.16 billion gallons of gasoline a year. BAILEY ET AL., *supra* note 2 at 13. This figure reflects the additional secondary benefits from more efficient transit oriented land use development patterns. *Id.* at 11-13.

12. SHAPIRO ET AL., *supra* note 1 at 16.

13. *Id.* at 14.

14. *Id.*

15. *Id.* at 16. As of 1998, the average energy needed to carry a person one mile by an automobile was 6438.2 BTUs, compared with 2740.8 BTUs by public transportation. *Id.*

16. SHRANK & LOMAX, *supra* note 3 at 8.

17. TODD LITMAN, EVALUATING PUBLIC TRANSIT BENEFITS AND COSTS BEST PRACTICES GUIDEBOOK 27 (2006), available at <http://www.vtpi.org/tranben.pdf>.

18. *Id.* at 28.

five city-block mass of moving automobiles.¹⁹ By taking those who drive off the road and onto a bus or train, public transportation can cut the number of automobiles on the street and reduce the amount of gasoline burned.

In addition to providing considerable energy savings, public transportation facilitates cleaner air. Public transportation's ability to transport more people on less fuel, combined with its utilization of cleaner energy sources, including electricity, electric-gasoline hybrid engines, CNG, and LPG, results in a vast decrease in major air pollutants.²⁰ Public transportation systems significantly lessen the amount of volatile organic compounds (VOCs), nitrogen oxides (NO_x), carbon monoxide, (CO) and carbon dioxide (CO₂) in the air.²¹ In comparison to private automobiles, buses and rail systems together produce 92% less metric tons of VOCs, 95% fewer metric tons of CO and an almost 50% reduction of NO_x and CO₂.²²

To put these numbers in perspective, public transportation prevented over 77,000 metric tons of VOCs from being emitted in the United States in 1999.²³ This is roughly the same amount of VOCs released by the American metals processing industry and more than 11 times the VOCs produced by the American coal industry.²⁴ Public transportation's CO savings of over 821,000 metric tons is more than 75% the amount of CO produced by all the chemical manufacturers in the United States.²⁵ Buses and rails in the United States saved almost 30,000 metric tons of NO_x from being released into the air, which is more than one-third of the NO_x emissions generated by oil and gas producers.²⁶ Utilizing public transportation averts 6.9 million metric tons of CO₂ from being released into the ambient air annually.²⁷ These comparisons offer a remarkable example of just how much public transportation can decrease the presence of many dangerous pollutants and improve the quality of our air.

With cleaner air results comes a healthier populace. A comprehensive analysis conducted in 1991 found that automobile emissions caused

19. DEV., CMTY., & ENV'T. DIV., *supra* note 4 at 66.

20. SHAPIRO ET AL., *supra* note 1 at 20.

21. *Id.* at 24.

22. *Id.*

23. *Id.*

24. *Id.*

25. *Id.* at 25.

26. *Id.*

27. TODD DAVIS & MONICA HALE, PUBLIC TRANSPORTATION'S CONTRIBUTION TO U.S. GREENHOUSE GAS REDUCTION 1-2 (2007), available at http://www.apta.com/research/info/online/documents/climate_change.pdf. A different study estimated that public transportation reduces annual CO₂ emissions by 37 million metric tons annually. BAILEY ET AL., *supra* note 2 at 13. This figure reflects the additional secondary benefits from more efficient land use development patterns. *Id.*

852 million headaches from CO, between 20,000 and 46,000 cases of chronic respiratory illness and 530 cases of cancer in the United States.²⁸ In Delhi, one out of every ten school children suffers from asthma.²⁹ The World Health Organization reported that 3 million people a year die from complications triggered by air pollution worldwide.³⁰ Half of these deaths were caused by automobile emissions.³¹ Airborne particulate, a significant source of which is emissions, has caused around 25,000 premature deaths in China's capital city of Beijing in 2002 alone.³² Additionally, harmful emissions from one country can affect another. The USEPA estimates that on some days, around twenty-five percent of the air pollutants in the skies of Los Angeles can be traced to China.³³

Ozone, which is the main component of smog, is produced near ground level when VOCs and NO_x combine with sunlight.³⁴ Ground level ozone causes many deleterious health conditions, which include irritation of the respiratory system, reduced lung function up to lung cancer, permanent lung damage and aggravation of asthma, emphysema, bronchitis and other chronic lung diseases.³⁵ CO, which hinders the absorption of oxygen throughout the body, can have a devastating impact on the cardiovascular and central nervous systems.³⁶ These dangerous consequences include chest pain, headaches, dizziness, nausea, fatigue, slower reflexes, decreased manual dexterity and an impaired ability to visually perceive, work and learn.³⁷

Buses and cars are also involved in proportionally fewer traffic incidents than automobiles. A 2006 analysis conducted by the National Safety Council revealed that public transit has 0.03 fatal accidents per 100 million miles, which is 1/25th the rate for automobiles.³⁸ The same trend exists for non-fatal injuries as well.³⁹ China, with only 2.6 percent of the

28. DEV., CMTY., & ENV'T. DIV., *supra* note 4 at 28.

29. Ravindra et al., *supra* note 4 at 2.

30. Fischlowitz-Roberts, *supra* note 4 at 33.

31. *Id.*

32. Jim Yardley, Smoggy Beijing to Cut Traffic by Half for Olympics, Paper Says, N.Y. TIMES, Jan. 24, 2008, at A18.

33. Thomas L. Friedman, *The Power of Green*, N.Y. TIMES, Apr. 15, 2007, at 640, available at <http://www.nytimes.com/2007/04/15/magazine/15green.t.html>.

34. SHAPIRO ET AL., *supra* note 1 at 8.

35. U.S. ENVTL. PROT. AGENCY, EPA-452/F-99-003, OZONE AND YOUR HEALTH 2 (1999), available at <http://airnow.gov/index.cfm?action=static.brochure>.

36. United States Environmental Protection Agency, *Health and Environmental Impacts of CO*, <http://www.epa.gov/air/urbanair/co/hlth1.html> (last visited Sept. 22, 2008).

37. DEV., CMTY., & ENV'T. DIV., *supra* note 4 at 28.

38. AM. PUB. TRANSP. ASS'N, PUBLIC TRANSPORTATION: BENEFITS FOR THE 21ST CENTURY 7 (2007), available at http://www.apta.com/research/info/online/documents/twenty_first_century.pdf.

39. *Id.*

world's vehicles, had twenty-one percent of its road fatalities in 2002.⁴⁰ In Beijing alone, 5,808 traffic accidents caused 1,373 deaths last year.⁴¹ Automobile accidents will only increase as more and more automobiles are added to roads around the world each year. Ridership on buses and rails benefits public health because the utilization of public transportation appreciably decreases the amount of the injurious emissions and road accidents that cause numerous conditions, which range from a nagging headache to premature death.

The benefits that arise from the reduced emissions of public transportation stretch beyond cleaner air. Riding public transportation prevents further damage to water quality from increasing amounts of NO_x. The excessive release of NO_x interferes with the delicate hydrological balance of water bodies and facilitates eutrophication, which causes the depletion of oxygen in the water and damages the fish and shellfish population.⁴² When nitric acid, whose acid precursor is NO_x, combines with sulfuric acid, water vapor and oxygen in the atmosphere, acids are produced and reach the surface with various forms of precipitation.⁴³ This process of acidification can interfere with many biological functions of aquatic organisms, including breathing and reproduction and decrease biodiversity in water bodies.⁴⁴

CO₂ and nitrous oxide, a member of the NO_x family, are greenhouse gases that are causing worldwide climate change. Greater use of public transportation can be an important check on reducing greenhouse gases and reversing global warming. It is estimated that American public transportation prevented 400,000 metric of greenhouse gases, including sulfur hexafluoride, hydrofluorocarbons, perfluorocarbons and chlorofluorocarbons.⁴⁵ If Americans rode public transportation as much as Europeans do, at a user rate roughly equivalent to 10% of daily travel needs, the United States, who is the world's largest producer of CO₂ would reduce emissions of this greenhouse gas by more than 25% of Kyoto Protocol targets.⁴⁶ Thus, the ability of public transportation to reduce the amount

40. Ted Conover, *Capitalist Roaders*, N.Y. TIMES, July 2, 2006, at 30, available at http://www.nytimes.com/2006/07/02/magazine/02china.html?_r=1&oref=slogin&pagewanted=print.

41. *Beijing Has More and More Cars*, XINHUA ECON. NEWS, January 22, 2007.

42. Office of Air Quality Planning & Standards, U.S. Env'tl. Prot. Agency, EPA-456/F-98-005, NO_x How Nitrogen Oxides Affect the Way We Live and Breathe 2 (1998), available at <http://www.epa.gov/oar/noxfldr.pdf>.

43. United States Environmental Protection Agency, *What is Acid Rain?*, <http://www.epa.gov/acidrain/what/index.html> (last visited Sept. 23, 2008).

44. United States Environmental Protection Agency, *Effects of Acid Rain – Surface Waters and Aquatic Animals*, http://www.epa.gov/acidrain/effects/surface_water.html (last visited Sept. 23, 2008).

45. DAVIS & HALE, *supra* note 27 at 12.

46. SHAPIRO ET AL., *supra* note 1 at 12.

of pollutants in the air can deliver vital benefits including cleaner air, safer water and the release of fewer greenhouse gases.

By promoting further utilization of existing development, public transportation can also preserve open space and protect environmentally sensitive lands. Increased ridership on new and existing buses and rails can reduce the need for the construction of new roads that facilitate sprawl and promote further dependence on the automobile. Transit decreases the amount of land that must be paved for roads, generates investment around existing public transit infrastructure and stimulates urban redevelopment, all of which are important components of a smart growth strategy.⁴⁷ Preventing new roads from being built in undeveloped areas is environmentally significant because in addition to reduced energy consumption, decreased emissions and improved public health, public transit systems can preserve wetlands, stem habitat loss and habit fragmentation, and prevent the invasion of non-native species.⁴⁸ It is estimated that habit destruction is the main threat to more than 80% of the species listed under the Endangered Species Act.⁴⁹ By encouraging ridership on existing transit systems and investing in new buses and rails, public transportation can diminish demand for new road construction, advance smart growth goals and protect open space.

III. GOING FOR THE GREEN – EXPANDING THE BEIJING SUBWAY FOR 2008 AND BEYOND

A. BEIJING'S DIRTY AIR AND CONGESTED ROADS

"In Beijing, you cannot only smell the air pollution but you can almost touch it."

-Stavros Dimas, European Union Environment Commissioner⁵⁰

Many consider the air in Beijing, China's capital city, to be the most polluted of any major city in the world.⁵¹ According to data released at the 2006 Better Air Quality Conference in Yogyakarta, Indonesia, Beijing's air contained 142 micrograms of particles of pollution dust per cubic meter, compared to New York's twenty-seven, London's twenty-four and Paris' twenty-two.⁵² The World Health Organization's target is twenty.⁵³

47. LITMAN, *supra* note 17 at 51.

48. DEV., CMTY., & ENV'T. DIV., *supra* note 4 at 12-15.

49. *Id.* at 12-13.

50. Interview by Sebastian Knauer with Stavros Dimas, Comm'r for the Env't, Eur. Union (Mar. 12, 2007), *available at* <http://www.spiegel.de/international/spiegel/0,1518,471188,00.html>.

51. Thomas Fuller, *Asian Conference Focuses on Worsening Air Pollution*, INT'L HERALD TRIBUNE, Dec. 15, 2006, *available at* <http://www.ihf.com/articles/2006/12/15/news/pollute.php#>.

52. *Id.*

53. *Id.*

This study measured microscopic dust small enough to get trapped in the lungs when inhaled, which many scientists believe to be the most injurious component of air pollution to people because it has been linked to respiratory disease, cancer and other deadly health conditions.⁵⁴

Satellite images produced by the European Space Agency reveal that China's capital has the planet's highest concentration of nitrogen dioxide, a potentially fatal pollutant.⁵⁵ The city's level of nitrogen dioxide is more than seventy-eight percent higher than World Health Organization clean-air guidelines.⁵⁶ Beijing's 2004 level of sulfur dioxide in the air was more than double of New York's.⁵⁷ This dirty air has fatal consequences. The Chinese Academy of Environmental Planning estimated that air pollution caused 411,000 premature deaths resulting from heart and lung diseases.⁵⁸ The World Health Organization/United Nations Environment Program stated that between twenty and thirty percent of all respiratory disease in Beijing and other large Asian cities is caused by air pollution.⁵⁹

Despite the critical air quality situation in Beijing, a burgeoning car culture is expanding at a breakneck pace.⁶⁰ This trend is especially noteworthy, considering that private ownership of automobiles in China was only permitted by the government in the mid 1990s.⁶¹ In 1996, the number of privately owned cars in Beijing increased from 0.17 million to 1.4 million in only eight years.⁶² Currently, there are 2.88 million automobiles on Beijing pavement, with 2.06 million of these in private hands.⁶³ Cars are being added to Beijing's roads at the rate of 1,000 a day; 22,079 new motor vehicles were registered in China's capital city in the first eighteen days of 2007 alone.⁶⁴ It is estimated that by the Olympic Summer Games in 2008, there will be over 3.3 million automobiles traversing Beijing's overcrowded roads⁶⁵ and more than 3.8 by 2010.⁶⁶

54. *Id.*

55. Jonathan Watts, *Satellite Data Reveals Beijing as Air Pollution Capital of World*, GUARDIAN, Oct. 31, 2005, available at <http://www.guardian.co.uk/news/2005/oct/31/china.pollution>.

56. Gordon Fairclough & Shai Oster, *As China's Auto Market Booms, Leaders Clash Over Heavy Toll*, WALL ST. J., June 13, 2006, available at <http://www.pulitzer.org/archives.org/7143> (last visited Sept. 22, 2008).

57. Conover, *supra* note 40.

58. Watts, *supra* note 55 at 22.

59. Divya Abhat et al., *Cities of the Future*, E – THE ENVIRONMENTAL MAGAZINE, available at <http://www.emagazine.com/view/?2849>.

60. [new cite] Beijing Has More and More Cars, *supra* note 41.

61. Conover, *supra* note 40 at 30.

62. The World Bank, *China: Building Institutions for Sustainable Urban Transport 3* (EASTR Working Paper No. 4, 2006), available at <http://siteresources.worldbank.org/INT/URBANTRANSPORT/Resources/340136-1152205421441/China-UT-AAA-Report-2006.pdf>.

63. Beijing Has More and More Cars, *supra* note 41.

64. *Id.*

65. *Id.*

This dizzying growth has transformed a city that was once dominated by a redoubtable mass of bicycles.⁶⁷ Average peak-hour vehicle speeds on Beijing's major arterial and circumferential roads have steadily declined from 45 km per hour in 1994, to 33 in 1995, 20 in 1996, 12 in 2003, and less than 10 in 2005.⁶⁸ Unsurprisingly, a September 2006 report conducted by the Beijing International Institute for Urban Development maintained that Beijing traffic is rated as the "most unsatisfactory" of 287 Chinese cities.⁶⁹ Most respondents to a Beijing Statistics Bureau public opinion poll listed the city's traffic as the most pressing issue facing the local government, ahead of health care and employment.⁷⁰ Despite this extreme dissatisfaction with constant traffic gridlock, fifty-eight percent of Beijing residents stated that owning a car was their "biggest dream."⁷¹

Beijingers' avid appetite for the car represents perhaps the most considerable threat to the city's already noxious air. According to State Environmental Protection Administration (SEPA) 2005 calculations, automobile emissions were responsible for almost eighty percent of the total CO and hydrocarbons found in Chinese urban areas.⁷² Another analysis states that cars produce eighty percent of the CO, seventy-five percent of the hydrocarbons, sixty-eight percent of NOx and fifty percent of other particulate matter found in Beijing's air.⁷³ The connection between the increased number of automobiles on Beijing's roads and poor air quality is unavoidable. Pan Yue, vice minister of SEPA has pithily stated that "the reason behind Beijing's air-quality problem is automobiles. . . tremendous environmental problems have been created as a result of this industry's growth."⁷⁴

B. THE BEIJING SUBWAY – PAST AND PRESENT

For Beijing and the rest of China, civic and national pride is also at stake. The city and the entire country will be on the world stage when Beijing hosts the 2008 Summer Olympics, which China sees as an opportunity to display the many benefits of years of unbridled and vigorous

66. Million Dollar Subsidy to Boost Beijing Public Transit, XINHUA ECON. NEWS, Jan. 11, 2007.

67. *China Ends 'Bicycle Kingdom' as Embracing Cars*, CHINA DAILY, Nov. 11, 2004, available at http://www.chinadaily.com.cn/english/doc/2004-11/11/content_390685.htm.

68. The World Bank, *supra* note 62 at 3.

69. Number of Vehicles on Beijing's Roads Approaches 3 Mln, AFX ASIA FOCUS, Jan. 23, 2007.

70. Traffic Jam Main Concern of Beijing Residents: Survey, PRESS TR. INDIA, Jan. 17, 2007.

71. Lee Spears, *Beijing Cleanup is Olympian Task*, INT'L HERALD TRIB., Apr. 12, 2006.

72. The World Bank, *supra* note 62 at 3.

73. Sun Xiaohua, *Five-Year Plan Targets Air Pollution*, CHINA DAILY, Dec. 1, 2006, available at http://www.chinadaily.com.cn/cndy/2006-12/01/content_747766.htm.

74. Spears, *supra* note 71.

economic expansion.⁷⁵ A central component of Beijing's successful bid for the 2008 Olympiad was the city's promise to deliver a "Green Olympics" after a previous attempt was thwarted due to the city's noxious air pollution.⁷⁶ This pledge inspired robust environmental commitments ranging from the improvement of water quality, promotion of energy conservation to planting more trees throughout the city.⁷⁷ One of the most ambitious and fundamental goals of the "Green Olympics" was Beijing's intention to comply with World Health Organization air quality standards by the time the games are held in the summer of 2008.⁷⁸

Recognizing the nexus between a vast increase of automobiles on the roads and increased energy consumption, traffic congestion and air pollution, Beijing has chosen to make an expanded subway system a central component of its plan to fulfill its Olympic promise.⁷⁹ However, politicians, policymakers and environmentalists alike have realized that more is on the line than the transit needs of foreign visitors.⁸⁰ Rather, Beijing's leaders have recognized that the Olympiad represents a chance to tackle the complex and formidable environmental challenges faced by increased demand for the automobile through investing in an expansive, efficient and modern subway system for 2008 and beyond.⁸¹

Beijing's subway was the first to be built in China.⁸² Construction began in July 1965 and Zhu De, Deng Xiao'ping, Peng Zhen and Li Xian'nian, state leaders of the Chinese Communist government removed the first pieces of dirt at the groundbreaking ceremony.⁸³ The building of Beijing's subway system also had a military function: Mao Zedong ordered the construction of an "underground city" built between 1969 and 1979 that would house millions of people during a nuclear or chemical attack.⁸⁴ Today, the system is composed of seventy stations served by

75. Sunny Lee, *Beijing Lights Up Olympic Dream*, KOREA TIMES, Aug. 8, 2008, available at http://www.koreatimes.co.kr/www/news/sports/2008/08/253_29043.html.

76. Jim Yardley, *Beijing's Olympic Quest: Turn Smoggy Sky Blue*, N.Y. TIMES, Dec. 29, 2007.

77. See The Beijing Organizing Committee for the Games of the XXIX Olympiad, *Beijing 2008 Green Olympics: Progress v Challenge*, <http://en.beijing2008.cn/12/12/greenolympics.shtml> (last visited Sept. 22, 2008).

78. Spears, *supra* note 71.

79. *Id.*

80. Zhu Yifan Quan Xiaoshu, *Beijing Olympics Legacy More Profound than Visible Success*, XINHUA ECON. NEWS, Aug. 28, 2008.

81. *Id.*

82. Beijing Subway, *Menagement's [sic] Address*, <http://www.bjsubway.com/ens/sis/iof/index.html> (last visited Nov. 9, 2008).

83. Beijing Subway, *The State Leader's Care and Guidance*, <http://www.bjsubway.com/ens/sis/iof/guidance/index.html> (last visited Sept. 22, 2008).

84. Jonathan Watts, *Beijing Plans to Overtake London with World's Longest Subway*, GUARDIAN, Nov. 21, 2006, available at <http://www.guardian.co.uk/world/2006/nov/21/transport.china>.

four lines, Line 1, Line 2, Line 13 and Line Ba-Tong over 114 kilometers (70.84 miles) of track.⁸⁵ Some 2.1 million passengers ride the Beijing Subway everyday.⁸⁶

The system is currently undergoing an ambitious expansion program that if completed, would make Beijing's subway the longest in the world.⁸⁷ Three entirely new routes will begin taking passengers for the 2008 Olympic Games.⁸⁸ This first round of expansion includes Line 5, which will be the first significant north-south route in the system, Line 10, a west-southeast subway line and the Airport Line.⁸⁹ These improvements add around 90 km (55.92 miles) to Beijing's subway, an almost two-fold increase in track length.⁹⁰ Enhancements to the system go beyond laying down more rails. One hundred eighty-four new subway cars, will be added to Beijing's underground tunnels by May 2008.⁹¹ One train composed of these new cars will be able to transport 400 more passengers than current ones.⁹² This new rolling stock also means the waiting time for trains will be shortened. On Line 2, waits will be reduced from three minutes to two.⁹³

These noteworthy improvements in Beijing's rapid public transportation infrastructure represent a very significant attempt to alleviate the city's traffic. In 2004, Beijing's spending on public transit was equal to five percent of the city's gross domestic product, "a very high rate by world standards."⁹⁴ The city has pledged 4 billion yuan (about 622 million US dollars) for public transportation in 2007, a rise of 1.31 billion yuan (164 million US dollars) from 2006.⁹⁵ In 2007, the municipal finance will also spend 11.67 billion yuan (1.5 billion US dollars) in supporting improvement of public transportation infrastructure.⁹⁶ This practical yet necessary spending has no doubt been authorized in an attempt to deal with Beijing's immense traffic before large numbers of foreign tourists arrive for the Olympiad. Beijing's Mayor Wang Qishan has stated that his "top priority" was to improve Beijing automobile congestion in time

85. Beijing Subway, *General Introduction of the Company*, <http://www.bjsubway.com/ensis/iof/General/index.html> (last visited Sept. 22, 2008).

86. Beijing to Put 264 New Subway Cars into Use, XINHUA NEWS AGENCY, Jan. 16, 2007.

87. Watts, *supra* note 84.

88. Watts, *supra* note 84.

89. *Beijing Announces Opening Dates for Four Subway Lines*, XINHUA NEWS AGENCY, Jan. 17, 2007; Zhu Lizhen, *Beijing No.5 Subway Line Launches Overall Construction*, June 26, 2003, http://english.peopledaily.com.cn/200306/26/eng20030626_118933.shtml.

90. *Beijing Announces Opening Dates for Four Subway Lines*, *supra* note 89.

91. Beijing to Put 264 New Subway Cars into Use, *supra* note 86.

92. *Id.*

93. *Id.*

94. The World Bank, *supra* note 62.

95. Million Dollar Subsidy to Boost Beijing Public Transit, *supra* note 66.

96. *Id.*

for the 2008 Games.⁹⁷

C. A CATALYST FOR SUBWAY EXPANSION

However, Beijing's debilitating traffic crisis will not disappear when the tourists leave. With the long term sustainability of China's capital city in mind, many have expressed that investment in an attractive and extensive public transportation is the most effective way to take cars off of Beijing's clogged streets.⁹⁸ Recognizing that "increasing the length of roads can never catch up with the growth in the number of motor vehicles,"⁹⁹ Beijing has formulated a progressive plan that will quintuple the size of the current metro system.¹⁰⁰ If realized, Beijing's subway would be composed of nineteen lines, ten more than are expected to be operating in time for the 2008 games, running on 561.5 kilometers (348.9 miles) of rail.¹⁰¹ This would make the Beijing Subway 160 kilometers (99.4 miles) longer than London's Underground, which is currently the world's largest.¹⁰²

To implement this transit-oriented approach, Beijing has earmarked 100 billion yuan (\$12.6 billion),¹⁰³ which would add one new line to the system each year until 2020.¹⁰⁴ The aim of the expansion is to connect urban areas to previously unconnected urban areas and to quickly developing suburbs to decrease further reliance on the automobile and make public transit a more viable and attractive transit option.¹⁰⁵

97. Beijing Wrestles with Urban Traffic Congestion, XINHUA NEWS AGENCY, Nov. 17, 2006.

98. *Id.*

99. *Beijing Has More and More Cars*, *supra* note 41. (quoting the deputy director of the Beijing Municipal Traffic Management Bureau, Zhai Shuanghe).

100. Watts, *supra* note 84.

101. Beijing to Put 264 New Subway Cars into Use, *supra* note 86.

102. Watts, *supra* note 84.

103. *Beijing Has More and More Cars*, *supra* note 41.

104. Watts, *supra* note 84.

105. Beijing's No. 10 Subway Line to be Extended, XINHUA NEWS AGENCY, Oct. 25, 2006; China Builds First Inter-City Subway, XINHUA NEWS AGENCY, June 29, 2007.

FIGURE 1 - CURRENT MAP OF THE BEIJING SUBWAY¹⁰⁶

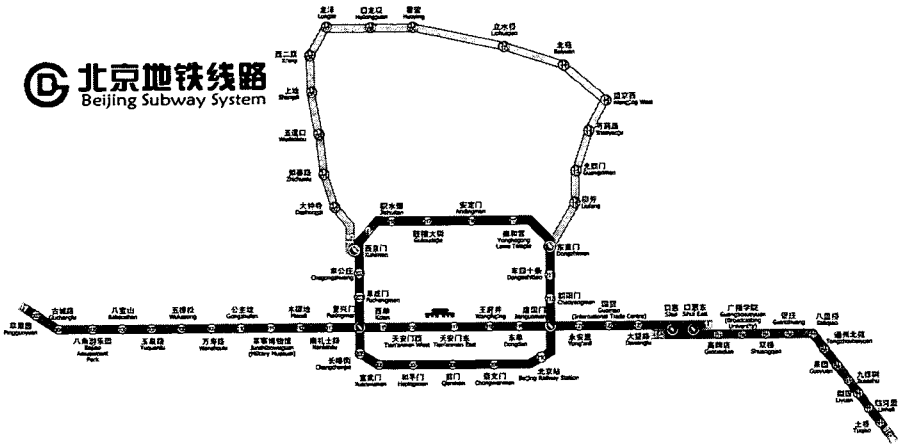
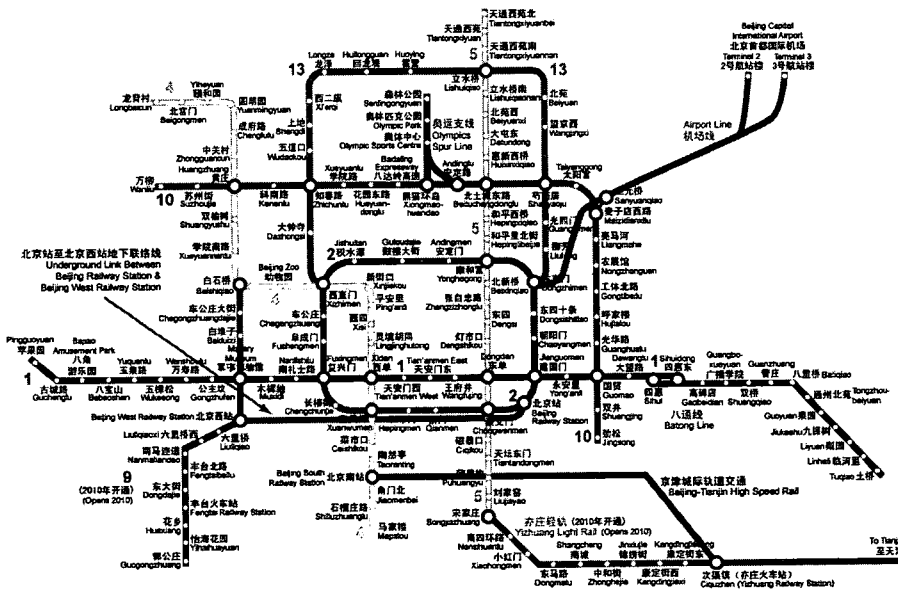


FIGURE 2 - PLANNED EXPANSION OF THE BEIJING SUBWAY¹⁰⁷



Thus, for the politicians, planners and policy makers of Beijing, the 2008 Olympiad has been treated as an opening to transform the city's

106. Wikipedia.com, *Beijing Subway*, http://en.wikipedia.org/wiki/Beijing_subway. (last visited Sept. 23, 2008).

107. *Id.*

pressing traffic crisis.¹⁰⁸ To many, the Summer Games is a unique chance to grapple with the economic and environmental consequences of the automobile boom in Beijing. Liu Qi, president of the Beijing Organizing Committee for the Games of the XXIX Olympiad (BOCOG), embodied this pragmatic yet forward-looking approach when he stated that “the problems that exist in Beijing, such as traffic jams and environmental pollution, are things we have to solve, whether we are hosting the Olympics or not. . . preparing for the Games should allow us to bring solutions to these problems ahead of schedule”¹⁰⁹ Yu Xiaoxuan, director of the Beijing Organizing Committee for the Games of the XXIX Olympiad BOCOG environmental activities department echoed this belief when he stated that “We are a developing country with relatively underdeveloped infrastructure. We should not expect all the environmental problems to be solved before 2008. Our goal is to take the opportunity of hosting the event to speed up clean-up efforts.”¹¹⁰

Through the adoption of a comprehensive expansion subway plan, many in Beijing are using its hosting of the 2008 Summer Olympics as an opportunity to solve Beijing’s crippling traffic situation and increase awareness of the far-reaching environmental benefits of public transportation. While it is not possible to squelch Beijing’s appetite for the automobile, an extensive Beijing Subway can be a viable transportation alternative while reducing energy consumption, traffic congestion and improving air quality and the public health.

IV. CLEAN BY DECREE – COMPRESSED NATURAL GAS BUSES IN DELHI, INDIA

Law alone also cannot help in restoring a balance in the biospheric disturbance. Nor can funds help effectively. The situation requires a clear perception and imaginative planning. It also requires sustained effort and result oriented strategic action.

- Chief Judge Ranganath Misra, Supreme Court of India¹¹¹

Like Beijing, the skies of Delhi, India are filled with many harmful and dangerous pollutants.¹¹² According to the same study that found Beijing to be the dirtiest largest city in the world, Delhi was not far be-

108. *Convenient, Clean Beijing Promised for Games*, CHINA DAILY, Aug. 7, 2006, available at http://www.chinadaily.com.cn/china/2006-08/07/content_658503.htm.

109. *Id.*

110. Shi Jiangtao, *Fighting For Breath*, SOUTH CHINA MORNING POST, Aug. 8, 2006 at 16.

111. M.C. Mehta v. Union of India, No.13029/1985, (India Mar. 14, 1991), <http://www.elaw.org/node/1336>.

112. Maureen L. Cropper et al., World Dev. Res. Group, *The Health Effects of Air Pollution in Delhi, India*, 4, 24, (World Bank, Dev. Research Group, Working Paper No. 1860, 1997), available at http://www.cleanairnet.org/caiasia/1412/articles-58255_resource_4.pdf

hind with over 120 micrograms of particles of pollution dust per cubic meter, well above the World Health Organization baseline.¹¹³

In Delhi, diesel once accounted for over two-thirds of fuel consumption in the Indian capital.¹¹⁴ These emissions are even more hazardous to human health because they produce ten to one-hundred more times particulate matter and contain more potent carcinogens than gasoline.¹¹⁵ Diesel-run automobiles emit almost five times the amount of NOx compared to cars that use gasoline.¹¹⁶ A report cited by the Supreme Court of India stated that “that ninety percent of the PM and nitrogen oxides (NOx) from vehicular emissions in Delhi come from the exhaust of diesel-powered vehicles.”¹¹⁷ It is estimated that air pollution from emissions causes anywhere between 7,500 and 10,000 premature deaths in the Indian capital.¹¹⁸ Unlike Beijing, where the government needed a catalyst for expanding environmentally favorable public transportation, the Supreme Court of India took matters into its own hands and mandated the alteration of all diesel-powered commercial vehicles, including public buses, in Delhi to CNG in response to a public interest lawsuit.¹¹⁹

A. STANDING IN THE SUPREME COURT OF INDIA AND
CONSTITUTIONAL PROVISIONS RELEVANT
TO THE ENVIRONMENT

A liberal view of standing and an enforceable right to a healthful environment were necessary for the Supreme Court of India’s order to be legitimate. Any citizen or a representative thereof is allowed to appeal directly to the Court to protect fundamental rights.¹²⁰ This approach, which was aimed at opening up the Supreme Court to Indians of all socio-economic backgrounds,¹²¹ has inspired public interest lawyers to file lawsuits on behalf of citizens to address law enforcement excesses,

113. *Id.*

114. Ravindra et al., *supra* note 4 at 2.

115. *Id.*

116. Ctr. for Sci. & Env’t, *The Leap Frog Factor Clearing the Air In Asian Cities* 33 (2006), http://www.cseindia.org/campaign/apc/leapfrog_factor.PDF.

117. M.C. Mehta v. Union of India, Nos. 13029/1985, 939/1996, 13208/1998 (India Apr. 16, 1999), <http://www.elaw.org/node/2778>.

118. Ravindra et al., *supra* note 4 at 2; *see also* Armen Rosencranz & Michael Jackson, *The Delhi Pollution Case: The Supreme Court of India and the Limits of Judicial Power*, 28 COLUM. J. ENVL. L. 223, 232 (2003) (citing Press Release, Centre for Science and Environment, Centre for Science and Environment Accuses Delhi Government of Trying to Sabotage Supreme Court Orders to Move Diesel Buses to CNG (July 18, 2000), http://www.cseindia.org/html/cmp/air/press_20000718.htm).

119. Rosencranz & Jackson, *supra* note 118 at 224, (citing S.C. Writ Pet. (Civil), M.C. Mehta v. Union of India (July 28, 1998) (No. 13029/1985)).

120. *Id.* at 230.

121. *Id.*

penitentiary reform, health care, child labor and welfare, education, privacy issues, economic rights, and most importantly for the breathers of Delhi air, environmental protection.¹²²

In addition to flexible standing, the Supreme Court of India has interpreted various provisions of the Constitution of India to instill a duty on the government to protect the environment and improve public health.¹²³ Over a series of cases, the Supreme Court has ruled that Article 21's guarantee of a "right to life" includes the substantive "right to live in a healthy environment with minimum disturbance of ecological balance. . . without avoidable hazard to [the people] and to their cattle, house and agricultural land, and undue affection (sic) of air, water, and environment"¹²⁴ and as a protected fundamental right, creates a governmental duty to prevent environmental degradation.¹²⁵

Other sections of the Indian Constitution explicitly address advancing the cause of public health. Article 39(e), which states "that the health and strength of workers, men and women, and the tender age of children are not abused. . ." and Article 47, which requires the government to "regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties. . ." all impose a positive duty upon the government to protect and improve the health of Indian citizens.¹²⁶

The Indian Constitution is also one of the only in the world to include specific provisions and duties for protecting the environment.¹²⁷ This responsibility lies with both the Indian government and the Indian people. Article 48A reads that "[t]he State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country."¹²⁸ Article 51A imposes an affirmative duty upon all Indians "to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures."¹²⁹

122. Shubhankar Dam, *Lawmaking Beyond Lawmakers: Understanding the Little Right and the Great Wrong (Analyzing the Legitimacy of the Nature of Judicial Lawmaking in India's Constitutional Dynamic)*, 13 *TUL. J. INT'L & COMP. L.*, Spring 2005, at 109, 115.

123. Scott LaFranchi, *Surveying the Precautionary Principle's Ongoing Global Development: The Evolution of an Emergent Environmental Management*, 32 *B.C. ENVTL. AFF. L. REV.* 679, 692 (2005).

124. Rosencranz & Jackson, *supra* note 118 at 231 (citing *Rural Litig. and Entitlement Kendra v. State of Uttar Pradesh*, A.I.R. 1989 S.C. 359).

125. *Id.* (citing *Charan Lal Sahu v. Union of India*, A.I.R. 1990 S.C. 1480).

126. *INDIA CONST.* art. 39(e); *INDIA CONST.* art. 47.

127. Rosencranz & Jackson, *supra* note 118 at 226.

128. *INDIA CONST.* art. 48A.

129. *India Const.* art. 51A (g).

B. THE SUPREME COURT TRIES ON JUDICIAL, LEGISLATIVE
AND EXECUTIVE HATS

With a favorable approach to standing and evocable rights, M.C. Mehta, a well-known Indian public interest lawyer brought an action in the Supreme Court of India against the Indian Government in 1985.¹³⁰ Mehta alleged that by not acting to improve Delhi's air quality, the Government failed to fulfill its duty of enforcing environmental laws and protecting the public health.¹³¹ After years of creating fact-finding commissions and directing Delhi government to state how it had regulated vehicle pollution in the city, the Supreme Court concluded "buses, trucks and defence vehicles" were the main culprits responsible for the poor condition of the Indian capital's air and that attention must be paid to these heavy vehicles in order to reduce pollution.¹³²

Noting that existing law was insufficient and that "imaginative planning. . .sustained effort and result oriented strategic action" were necessary for success,¹³³ the Supreme Court began issuing directives at what they saw was the crux of the problem – automobile emissions. In 1994, almost a decade after Mehta's suit was filed, the Court required the gradual elimination of leaded fuel in India's four largest metropolitan areas - Delhi, Bombay, Calcutta and Madras.¹³⁴ Less than two years later, the Supreme Court mandated that all government owned vehicles be converted to CNG or be fitted with a catalytic converter.¹³⁵ Finally, in 1998, the Supreme Court implemented the recommendation of a government committee created by the Ministry of Environment and Forests (MoEF) and required that all commercial passenger vehicles, including buses, in Delhi had to be converted from diesel fuel to CNG by March 31, 2001.¹³⁶

When even after two extensions these directives were not satisfied, the Supreme Court of India issued another command that included an aggressive timetable for the installation of CNG buses and the removal of diesel ones, discredited technological and economic critiques of its plan, instituted a fine on drivers of diesel buses and reiterated its responsibility to guard the public health.¹³⁷ "By December 2002, the last diesel bus had

130. Rosencranz & Jackson, *supra* note 118 at 232.

131. *Id.*

132. M.C. Mehta v. Union of India, No. 13029/1985, (India Nov. 14, 1990), <http://www.elaw.org/node/2638>.

133. Mehta v. Union of India, No. 13029/1985 (India Mar. 14, 1991), <http://www.elaw.org/node/1336>.

134. M.C. Mehta v. Union of India, No. 13029/1985 (India Oct. 21, 1994), <http://www.elaw.org/node/1505>.

135. S.C. Writ Pet. (Civil), M.C. Mehta v. Union of India (Apr. 26, 1996) (No. 13029/1985).

136. Rosencranz and Jackson, *supra* note 118 at 233.

137. *Id.* at 236-37 (citing M.C. Mehta v. Union of India, No. 13029/1985 (India Apr. 5, 2002), <http://www.elaw.org/node/1334>).

left Delhi, and 10,000 taxis, 12,000 buses and 80,000 rickshaws were powered by CNG.”¹³⁸

C. ENVIRONMENTAL BENEFITS OF THE INDIAN SUPREME COURT’S ORDERS

Over the course of almost twenty years, the Supreme Court was able to remove diesel buses from the streets of India’s capital through a series of orders.¹³⁹ The Court repeatedly stated its duty under the Indian Constitution to protect the environment and promote the public health to legitimize the CNG conversion.¹⁴⁰ Many studies have found that the Supreme Court’s orders have improved the quality of air and stabilized the emissions of certain pollutants.¹⁴¹ As a result of the public interest lawsuit, Delhi now boasts the highest percentage of CNG-powered public vehicles in the world¹⁴² and the Indian experience has inspired other cities around Asia to pursue similar courses of action.¹⁴³

Researchers analyzing the environmental consequences of the Indian Supreme Court’s orders have concluded that the various mandates have reduced the amount of many harmful pollutants in Delhi’s air.¹⁴⁴ According to an analysis completed by the Centre for Science and Environment (CSE), the cumulative effect of all the Supreme Court’s measures had reduced the particulate matter produced from mobile sources by thirty-eight percent, NO_x by thirty-one percent, CO by fifteen percent and hydrocarbons by eleven percent.¹⁴⁵ Cleaner fuel, new emission controls and the removal of older commercial vehicles have all played a part in cleaning up Delhi’s air.¹⁴⁶ For example, the number of heavy trucks, which the Supreme Court identified as a main cause of the poor air quality, has decreased from close to 80,000 in mid-1998 to about 60,000 in

138. Alex Perry, *The Climate Crusaders*, TIME, Apr. 3, 2006, at 57.

139. Brian Walsh, *Choking on Growth*, TIME ASIA, Dec. 13, 2004, <http://www.time.com/time/asia/covers/501041213/story3.html> (last visited Oct. 10, 2008).

140. See, E.g., National Law Institute University, *Right to Health: Limits on Recognition*, available at <http://www.nliu.com/Art1.htm> (last visited Oct. 6, 2008).

141. Darryl D’Monte, *Clearing the Air in our Cities*, July 17, 2006, <http://www.indiatogether.org/2006/jul/env-leapfrog.htm>.

142. Urvashi Narain & Alan Krupnick, Resources for the Future, *The Impact of Delhi’s CNG Program on Air Quality 25 (2007)*, available at <http://www.rff.org/Documents/RFF-DP-07-06.pdf>.

143. Ruth Greenspan et al., *Clearing the Air: How Delhi Broke the Logjam on Air Quality Reforms*, 46 ENV’T 22, 23 (Apr. 2004), available at <http://www.rff.org/News/Features/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=32000>.

144. Darryl D’Monte, *Clearing the Air in our Cities*, July 17, 2006, <http://www.indiatogether.org/2006/jul/env-leapfrog.htm>.

145. NARAIN & KRUPNICK, *supra* note 142 at 3.

146. See, Government of Delhi, Department of Transport, *Pollution Control*, <http://delhigovt.nic.in/newdelhi/dept/transport/tr2.asp> (last visited Oct. 1, 2008).

2005.¹⁴⁷ This reduction can be traced to both the forced retirement of older trucks and stricter emissions standards.¹⁴⁸

More specifically, the compulsory conversion of commercial vehicles to CNG has also had a positive impact on Delhi's environment: it is estimated CNG use has replaced the consumption of diesel and gasoline by more than 250,000 gallons each day.¹⁴⁹ India's capital city is now home to 10,600 CNG-powered buses, the largest fleet of this type in the world.¹⁵⁰ The CNG-powered buses have reduced the release of particular matter, CO and SO₂.¹⁵¹ This result is not surprising considering that automobile emissions comprise the vast majority of air pollution in Delhi and that CNG provide 90% reductions of carbon monoxide (CO) and particulate matter and more than 50% reduction in nitrogen oxides (NO_x) over commercial diesel engines.¹⁵² A sharp decline of polycyclic aromatic hydrocarbons (PAHs) has also been attributed to the Supreme Court's CNG plan.¹⁵³

The compulsory change to CNG has not been without its hiccups. During the transition period, the Supreme Court's ordered conversion caused significant commuter delays that even caused schools to close,¹⁵⁴ multiple hour waits at CNG fueling stations with lines stretching over half a mile,¹⁵⁵ violence by riders, drivers and operators¹⁵⁶ and a rash of fires and explosions aboard CNG buses.¹⁵⁷ Other critics believed that the Supreme Court overstepped its authority and did not possess the technological or scientific expertise to create and implement such a plan.¹⁵⁸ Despite these legitimate concerns, the Supreme Court's mandates have promoted an expanded system of public buses that run on cleaner fuel and reduce toxic emissions in India's capital city.

147. NARAIN & KRUPNICK, *supra* note 142 at 11.

148. *Id.* at 9-10.

149. John Larkin, India Sets Pace on Cleaner Air — Capital Converts Buses, Other Vehicles to Less-Polluting Fuel, WALL ST. J., Nov. 22, 2004, at A12.

150. CTR. FOR SCI. AND ENV'T, *supra* note 116 at 7.

151. NARAIN & KRUPNICK, *supra* note 142 at 18.

152. Alternative Fuels Data Center, U.S. Department of Energy, *Natural Gas Emissions*, http://www.afdc.energy.gov/afdc/vehicles/emissions_natural_gas.html (last visited Nov. 3, 2008).

153. Ravindra et al., *supra* note 4 at 6.

154. *Schools Shut As Govt Looks for More Buses*, TIMES OF INDIA, Apr. 8, 2002, available at <http://timesofindia.indiatimes.com/articleshow/6205692.cms>.

155. Celia W. Dugger, *In India's Capital, a Prayer for the Belching Buses*, N.Y. TIMES, Sep. 28, 2001, available at <http://www.nytimes.com> (last visited Sep. 29, 2008).

156. Rama Lakshmi, *Commuter Chaos in New Delhi; Pollution Regulations Shut Down Public Transportation*, WASH. POST, Apr. 7, 2001, at A16.

157. *Safety Norms to Cripple Bus Services*, TIMES OF INDIA, available at <http://portal.bsnl.in/bsnl2/content%20mgmt/html%20content/travel/travel432.html> (last visited Sept. 29, 2008).

158. See generally NARAIN & KRUPNICK, *supra* note 142.

V. NO RIDER LEFT BEHIND? SAFETEA-LU AND THE FUTURE OF
FEDERAL FUNDING FOR AMERICAN
PUBLIC TRANSPORTATION

"Never get between a congressman and asphalt because you will always get run over."

– Former Senator Rick Santorum (R-Pennsylvania)¹⁵⁹

Federal spending is necessary for the realization of public transportation projects throughout the United States. Money from the federal government comprises a vast majority of the funds spent on supporting new bus and rail systems and the modernization and expansion of existing ones. On August 10th, 2005, President George W. Bush signed the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (hereinafter SAFETEA-LU).¹⁶⁰ This legislation, which is the largest public works bill in American history, provides \$286.4 billion dollars in guaranteed federal funding for highway and transit projects throughout the United States.¹⁶¹ Yet only \$52.6 billion or around eighteen percent of total appropriations are devoted to federal transit programs.¹⁶²

This ratio reflects a historical preference for the automobile over public transportation. Before the enactment of SAFETEA-LU, public transit had received around \$50 billion since the creation of the Urban Mass Transit Administration (renamed the Federal Transit Administration in 1991) in 1964.¹⁶³ In comparison, \$205 billion have been devoted to road projects since 1956.¹⁶⁴ Federal law submits the construction of new transit projects and the expansion of existing ones to a considerably more rigorous review than that of highway projects, appropriates significantly fewer guaranteed funds to public transportation, and mandates covering a lower proportion of total project costs.¹⁶⁵ As a result, funding

159. Christopher Lee, *Senate Passes Transportation Bill; Potholes Mark Road Ahead*, WASH. POST, Feb. 13, 2004, available at http://www.itd.idaho.gov/transporter/2004/021304_Trans/021304_SAFETEASenate.html.

160. Federal Highway Administration, U, *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)*, <http://www.fhwa.dot.gov/safetealu/index.htm> (last visited Oct. 1, 2008).

161. Jenna Musselman, *SAFETEA-LU's Environmental Streamlining: Missing Opportunities for Meaningful Reform*, 33 *ECOLOGY L. Q.* 825, 844 (2006).

162. Federal Transit Administration, U.S. Department of Transportation, *SAFETEA-LU Implementation*, http://www.fta.dot.gov/index_4696.html (last visited Oct. 5, 2008).

163. Robert D. Bullard, *Addressing Urban Transportation Equity in the United States*, 31 *FORDHAM URB. L.J.* 1183, 1186 (Oct. 2004); see generally also Michael Lewyn, *Campaign of Sabotage: Big Government's War Against Public Transportation*, 26 *COLUM. J. ENVTL. L.* 259 (2001).

164. Bullard, *supra* note 163 at 1186.

165. Edward Beimbom and Robert Puentes, *Highways and Transit: Leveling the Playing Field in Federal Transportation Policy*, BROOKINGS INST. SERIES ON TRANSP. REFORM, Dec. 2003, at 8, available at http://www.brookings.edu/es/urban/publications/20031215_Beimbom.pdf.

for public transportation projects in the United States is less consistent and more difficult to secure than highway spending.¹⁶⁶

Despite this inequitable federal policy, Americans have been utilizing public transportation at record levels. In 2006, Americans took 10.1 billion trips on public transportation for the first time in almost half a century.¹⁶⁷ Since 1995, the growth rate of public transportation (thirty percent) has surpassed both the growth rates of population (twelve percent) and vehicle miles driven on American highways (twenty-four percent).¹⁶⁸ Light rail systems in San Jose, Minneapolis, New Jersey, Saint Louis, Philadelphia and Salt Lake City all saw double digit increases in ridership between 2005 and 2006.¹⁶⁹ Passenger figures for Los Angeles' and New Jersey's heavy rail systems also grew over ten percent from 2005 levels while commuter rail service in Miami skyrocketed over twenty-one percent.¹⁷⁰ These trends accelerated in 2007 and 2008 as a result of the soaring price of gasoline.¹⁷¹

A. FEDERAL INVESTMENT IN PUBLIC TRANSPORTATION

SAFETEA-LU's Capital Investment Grants program, which are divided between grants of \$75 million or more (hereinafter "New Starts") and grants of less than \$75 million (hereinafter "Small Starts") is the most significant way the federal government funds the creation, expansion and modernization of public transportation projects throughout the United States.¹⁷² Eligible recipients of the entirely discretionary funds appropriated by the federal government for New and Small Start grants include "public bodies and agencies. . .including states, municipalities, other political subdivisions of states[.]" as well as multi-state compacts and "certain public corporations[.]"¹⁷³ Money from the New Starts and Small Starts investments are solely for fixed guideway systems that use a separate right-of-way or rail line for the exclusive use of mass public transportation, including subway rapid rail, light rail, commuter rail and bus rapid transit.¹⁷⁴ These grant programs, among other things, fund the acquisi-

166. *Id.*

167. Press Release, Am. Pub. Transp. Ass'n, Americans Take More Than 10 Billion Trips on Public Transportation for the First Time in Almost Fifty Years (Mar. 12, 2007), available at http://www.apta.com/media/releases/070312_ten_billion.cfm.

168. *Id.*

169. *Id.*

170. *Id.*

171. Press Release, Am. Pub. Transp. Ass'n, Public Transit Ridership Surges in 2nd Quarter (Sep. 9, 2008), available at http://www.apta.com/media/releases/080909_ridership_report.cfm.

172. Beimborn & Puentes, *supra* note 165 at 15.

173. Federal Transit Administration, U.S. Department of Transportation, *Grants & Financing*, http://www.fta.dot.gov/funding/grants/grants_financing_3590.html (last visited Nov. 3, 2008).

174. Federal Transit Administration, U.S. Department of Transportation, *New Starts Project*

tion of real property, the rehabilitation and replacement of existing rolling stock and the construction of dedicated bus lanes and park and ride lots.¹⁷⁵

SAFETEA-LU empowers the Federal Transit Administration's New Starts grants to cover up to eighty percent of the net capital cost for new fixed guideway projects.¹⁷⁶ Despite this authorization, the Federal Transit Administration "encourages" the lowest possible funding share.¹⁷⁷ SAFETEA-LU also authorizes a higher federal match for projects whose cost and ridership estimates are within 10% of original forecasts and allows grantees to keep a portion of savings when under runs occur.¹⁷⁸

New Start grants are only allocated after localities complete a comprehensive, extensive and competitive evaluation procedure.¹⁷⁹ SAFETEA-LU authorizes more than 330 public transportation projects to vie for limited and discretionary federal funding.¹⁸⁰ The law requires the Federal Transit Administration to consider three broad criteria when considering New Start grant proposals: alternative analysis and preliminary engineering, project justification and local financial commitment.¹⁸¹ The first part of the thorough process requires potential recipients to consider various alignments for their projects, refine the designs with preliminary engineering, which includes studying project costs, benefits and environmental impact, and prepare final construction plans and cost estimates.¹⁸²

Next, the localities contending for federal money must be able to substantiate the positive impact of their project proposals. This includes mobility enhancements¹⁸³, environmental benefits¹⁸⁴, operation efficiency, cost effectiveness, favorable land use growth patterns and unde-

Planning & Development, http://www.fta.dot.gov/planning/planning_environment_5221.html (last visited Oct. 5, 2008).

175. Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, Pub. L. No. 109-59, 119 Stat. 1574 (codified as amended at 49 U.S.C. § 5309(d) (Supp. V 2005)).

176. Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy For Users, Pub. L. No. 109-59, 119 Stat. 1583 (codified as amended at 49 U.S.C. § 5309(h) (Supp. V 2005)).

177. Federal Transit Administration, U.S. Department of Transportation, *Grants & Financing*, http://www.fta.dot.gov/funding/grants/grants_financing_3590.html (last visited Oct. 5, 2008).

178. FED. TRANSIT ADMIN., U.S. DEP'T TRANSP., FTA AUTHORIZATION FACT SHEET CAPITAL INVESTMENT GRANTS "NEW STARTS", available at http://www.fta.dot.gov/documents/FTA_New_Starts_Fact_Sheet_Sept05.pdf (last visited Oct. 5, 2008).

179. Federal Public Transportation Act of 2005, 49 U.S.C. § 5309 (d) - (e) (Supp. V 2005).

180. Federal Transit Administration, U.S. Department of Transportation, *Introduction to New Starts*, http://www.fta.dot.gov/planning/newstarts/planning_environment_2608.html (last visited Oct. 5, 2008).

181. 49 U.S.C. § 5309 (d) (2) (A) - (C).

182. 49 U.S.C. § 5309 (d) (3) (A) - (D).

183. 49 U.S.C. § 5309 (d) (3) (G).

184. 49 U.S.C. § 5309 (d) (3) (D) (iii) - (iv).

fined “other factors.”¹⁸⁵ Finally, SAFETEA-LU demands that the possible grantees consider the level of local financial commitment to the potential project, which is represented by cost estimates, revenue forecasts, preparations for cost overruns and the financial viability of the sponsor.¹⁸⁶ Since New Start funding is discretionary, a favorable evaluation review does not “translate directly into a funding recommendation or commitment in any given year.”¹⁸⁷ Additionally, the process required by SAFETEA-LU requires many years of intense analysis and often millions of dollars to complete.¹⁸⁸

B. AUTHORIZATIONS VERSUS APPROPRIATIONS

SAFETEA-LU guarantees a \$52.6 billion investment for federal transit programs, which is a 46% increase over such funding in TEA-21.¹⁸⁹ However, the New and Small Starts grant programs, which the FTA describes as the “federal government’s primary financial resource for supporting locally-planned, implemented and operated transit ‘guideway’ capital investments,” is purely discretionary.¹⁹⁰ SAFETEA-LU authorizes the amount of funds that can be allocated for New and Small Starts Programs, but the President recommends and Congress determines exactly how much money is ultimately appropriated. Chart 1 presents these funding levels:

CHART 1 – SAFETEA-LU AUTHORIZATION LEVELS FOR FISCAL YEARS 2005 THROUGH 2009 (\$000)¹⁹¹

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Major Capital Investment Grants of \$75,000,000 or More (New Starts)	1,437,830	1,503,000	1,366,000	1,500,000	1,609,250
Capital Investment Grants Less Than \$75,000,000 (Small Starts)	N/A	N/A	200,000	200,000	200,000

185. 49 U.S.C. § 5309 (d) (3) (E) - (K).

186. 49 U.S.C. § 5309 (d) (4) (A) - (C).

187. Federal Transit Administration, U.S. Department of Transportation, *Introduction to New Starts*, http://www.fta.dot.gov/planning/newstarts/planning_environment_2608.html (last visited Oct. 5, 2008).

188. Beimborn & Puentes, *supra* note 165 at 8.

189. Federal Transit Administration, U.S. Department of Transportation, *SAFETEA-LU Implementation*, http://www.fta.dot.gov/index_4696.html (last visited Oct.5, 2008).

190. Federal Transit Administration, U.S. Department of Transportation, *Introduction to New Starts*, http://www.fta.dot.gov/planning/newstarts/planning_environment_2608.html (last visited Oct. 5, 2008).

191. Fed. Transit Admin., U.S. Dep’t Transp., *Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (Authorization Levels for*

Despite the fact that President Bush signed SAFETEA-LU into law, his administration has proposed deeper and deeper cuts to the New and Small Starts grant projects, which are crucial to the viability of public transportation in the United States.¹⁹² Chart 2 shows these called-for appropriation reductions:

CHART 2 – MISSED TARGETS FOR CAPITAL INVESTMENT GRANTS (\$000)¹⁹³

	FY 2006	FY 2007 (Recommended by President Bush)	FY 2008 (Recommended by President Bush)
Major Capital Investment Grants of \$75,000,000 or More	1,487,970	1,366,000	1,299,800
Capital Investment Grants Less Than \$75,000,000	N/A	100,000	100,000
Percent Difference from SAFETEA-LU Authorization Level	-1.00%	-6.40%	-17.66%

The most recent gap between SAFETEA-LU authorization levels and the Bush Administration's recommendation was completely bridged when Congress passed the FY 2007 Continuing Appropriations Resolution, which included \$8.975 billion for transit funding.¹⁹⁴ This trend continued most recently in Fiscal Year 2009, when President Bush's budget proposal included a \$202 million shortfall between SAFETEA-LU authorization levels and recommended allocation levels.¹⁹⁵ While the House of Representatives and the Senate have taken varying steps to bridge this gap, final legislative action has yet to taken.¹⁹⁶

Ridership levels on American public transportation systems are the

Fiscal Years 2005 Through 2009), available at http://www.fta.dot.gov/documents/SAFETEA-LU_Funding_by_Program_by_Year.pdf (last visited Oct. 5, 2008).

192. FED. TRANSIT ADMIN., U.S. DEP'T TRANSP., FY 2007 YEAR-OVER-YEAR COMPARISON, available at http://www.fta.dot.gov/documents/FY07_Year-Over-Year_Comparison.pdf (last visited Nov. 9, 2008).

193. FED. TRANSIT ADMIN., U.S. DEP'T TRANSP., BUDGET ESTIMATES FISCAL YEAR 2008 27, available at http://www.fta.dot.gov/documents/Budget_Estimates_FY_2008.pdf (last visited Nov. 9, 2008).

194. Am. Pub. Transp. Ass'n, Legislative Update FTA Issues Apportionments for FY 2007 Continuing Appropriations Resolution: \$8.975 Billion for Federal Transit Programs 1 (2007), available at http://www.apta.com/government_affairs/washrep/2007march26.cfm.

195. American Public Transportation Association, Legislative Update Bush Administration Releases FY 2009 Budget - \$10.135 Billion Proposed for Transit — Economic Stimulus Package Approved without Funds for Transit (Feb. 15, 2008), http://www.apta.com/government_affairs/washrep/2008feb15.cfm.

196. American Public Transportation Association, *Legislative Alert Congress Adjourns for August Recess* (Aug. 12, 2008), http://www.apta.com/government_affairs/washrep/2008august12.cfm.

highest in almost half a century.¹⁹⁷ Full funding of New and Small Starts grant programs are crucial to enticing new passengers to use buses and rails all the while reducing American dependence on foreign oil and improving the environment. Only with a consistent and significant federal investment in planning new transit systems and modernizing existing ones will Americans have a practical and appealing choice for their transportation needs.

VI. CONCLUSION

Our transportation choices greatly impact the state and health of the environment. Increased use of public transit can reduce energy consumption and traffic congestion while improving air and water quality, raising the level of public health, promoting sustainable development patterns and preserving ecologically sensitive lands. While China, India and the United States have all grappled with the varied consequences of fulfilling transportation demands in different ways, each entity has recognized the fundamental role public transit can play in improving the environment.

Yet the diverse approaches utilized by these countries alone are inadequate to address the numerous consequences of road-based transportation patterns. Beijing has created an ambitious proposal to expand its subway system, but China has even grander plans for its highway network. Although China's first modern expressway was built in the early 1990s, the government has released a plan to pave over 53,000 miles of expressway by 2035, which is about 7,000 miles longer than the entire length of the Interstate Highway System in the United States.¹⁹⁸ While the Supreme Court of India should be applauded for mandating the conversion of all commercial vehicles, including public buses, to CNG, it took almost two decades for its orders to be fully implemented. Additionally, the number of automobiles in India could grow up to thirteen times in the next thirty years, from 6.2 million in 2005 to around 80 million in 2035.¹⁹⁹ Demand for public transportation in the United States is increasing in spite of the existing federal policy for public transportation investment, not because of it. In the end, any environmental benefit derived from public transportation would be canceled out by increased demand for private automobiles.

197. Press Release, Am. Pub. Transp. Ass'n, Public Transit Ridership Surges in 2nd Quarter (Sept. 9, 2008).

198. Ted Conover, *Capitalist Roaders*, New York Times Sunday Magazine, July 2, 2006, available at http://www.nytimes.com/2006/07/02/magazine/02china.html?_r=1&scp=1&sq=Capitalist%20Roaders&st=cse&oref=slogin (last visited Oct. 5, 2008).

199. Asian Development Bank, Energy Efficiency and Climate Change Considerations for On-road Transport in Asia 4, 26 (working paper consultation draft May 19, 2006), available at http://www.cleanairnet.org/caiasia/1412/articles-70656_draft.pdf.

The most effective strategy needs to do more than make public transportation a viable option. It must also reduce the demand for driving. This is the aim of road pricing systems, which charges drivers to use roads at the most congested times. The revenue generated from these tolls is often invested in public transportation infrastructure. As a result, congestion pricing schemes deliver all of the environmental and public health benefits associated with reduced traffic while providing a significant and steady funding source for rail and bus modernization.

In February 2003, London began charging £5 to motorists driving in the central part of the city between 7:00 am and 6:30 pm on weekdays.²⁰⁰ This increased to £8 in July 2005.²⁰¹ Unsurprisingly, congestion dropped 30% and traffic speed increased 37%.²⁰² More importantly, air pollution decreased: particulate matter and NO_x emissions declined by 12% and CO₂ levels are down 20%.²⁰³ Fuel consumption has also been reduced by one-fifth.²⁰⁴

The funds raised by the congestion charge were devoted to improving public transportation in London. In FY 2006 alone, a quarter of a billion dollars raised by the price system was spent on expanding the public bus fleet and creating new bus routes.²⁰⁵ Ridership on London buses has increased almost 40%.²⁰⁶ This new investment has attracted new commuters, which took additional automobiles off of central London roads. The city government, with strong support from Londoners, doubled the size of the original congestion pricing zone in February 2007. Road pricing has both reduced demand for driving in the most congested part of the city while enhancing public transportation and attracting new riders.

London's experience with congestion pricing is representative of other cities that have implemented such a plan. In Singapore, which was one of the first localities to experiment with road pricing in 1975, traffic decreased by 45%, public transportation ridership increased by 20% and 176,400 fewer pounds of CO₂ were emitted after introduction of the driv-

200. TODD LITMAN, LONDON CONGESTION PRICING IMPLICATIONS FOR OTHER CITIES 2, (2006), available at <http://www.vtpi.org/london.pdf>. (including exceptions for motorcycles, licensed taxis, automobiles driven by disabled individuals, some vehicles that run on alternative fuels, buses and emergency vehicles).

201. *Id.*

202. ENVIRONMENTAL DEFENSE, ALL CHOKED UP HEAVY TRAFFIC, DIRTY AIR AND THE RISK TO NEW YORKERS 7 (2007), available at http://www.edf.org/documents/6117_AllChokedUp_NYCTrafficandHealthReport.pdf.

203. *Id.* at 7-8.

204. *Id.* at 8.

205. *Id.*

206. *Id.*

ing charge.²⁰⁷ In the Swedish capital of Stockholm, traffic was reduced by 15% and CO₂ emissions declined between 10 and 14 percent.²⁰⁸ Three cities in Norway, Oslo, Bergen and Trondheim, also began charging drivers to use inner city roads. In addition to easing congestion in all of these cities, revenue created by the charge went to improving public transportation systems, creating new bicycle paths and in Trondheim, a fleet of free public bicycles.²⁰⁹

Congestion pricing might be on its way to the United States. Mayor Michael Bloomberg appropriately chose this Earth Day to present a comprehensive plan intended to make New York “the first environmentally sustainable 21st century city.”²¹⁰ Part of his proposal included congestion pricing, which would charge \$8 for cars and \$21 for commercial trucks that enter Manhattan below 86th Street from 6 am to 6 pm on weekdays.²¹¹ Like the European cities that currently use congestion pricing, revenue raised will be devoted to improving public transportation infrastructure.²¹² It is estimated that the charge could raise as much as \$500 million dollars for transit projects,²¹³ and provide environmental benefits at least as significant as those enjoyed by Londoners.²¹⁴

After intense political wrangling during the summer, former New York Governor Eliot Spitzer signed a legislative compromise that created the seventeen-member New York City Traffic Congestion Mitigation Commission, which was charged with examining traffic alleviating strategies for Manhattan.²¹⁵ The law requires the panel to hold public meetings, take testimony and consider information and proposals for reducing traffic congestion.²¹⁶ While the commission will consider congestion pricing

207. *Id.* at 8.

208. *Id.* at 9.

209. *Id.*

210. Thomas J. Lueck, *Bloomberg Draws a 25-Year Blueprint for a Greener City*, N.Y. TIMES, Apr. 23, 2007, at B1.

211. *Id.* Under the Mayor’s proposal, the charge would be \$1 for drivers in Manhattan. *Id.*; There would be no charge to use the FDR Drive, the West Side Highway, or to follow alternate side parking. *Id.*; Taxis would not have to pay the congestion charge, either. *Id.*

212. *Id.*

213. Editorial, *Unlocking Gridlock*, N.Y. TIMES, Apr. 29, 2007, at section 14, 15.

214. ENVIRONMENTAL DEFENSE, *supra*, note 202 at 10. San Francisco is also considering implementing a road pricing system in its central business district as well. *Id.*

215. 2007 N.Y. Laws 384., 230th Sess. (N.Y. 2007). In the law, the legislature found that, “traffic congestion in New York city’s business district has a severe adverse impact on public health, the environment of New York city and adjoining areas, and overall employment and job development.” *Id.* at §1; *see also* Nicholas Confessore, *Spitzer Signs Bill to Put Congestion Pricing Plan on Track*, N.Y. TIMES, July 27, 2007, at B5.

216. N.Y. Laws 384, at §4; *see* William Neuman, *Members Named for Panel Studying Traffic Pricing Plan*, N.Y. TIMES, Aug. 22, 2007, at B2; *see also* Congestion Mitigation Commission, *Public Testimony and Hearing Transcripts*, https://qa.nysdot.gov/programs/congestion_mitigation_commission/public-testimony (last visited Sept. 23, 2008).

ing as a possible solution, it is free to propose alternative suggestions or decline to make any recommendation at all.²¹⁷ However, since a majority of the committee members were appointed by supporters of Mayor Bloomberg's initial proposal, there was a strong possibility that the body will approve congestion pricing in some form.²¹⁸

Pursuant to the law, the New York City Traffic Congestion Mitigation Commission approved an implementation plan on January 31, 2008.²¹⁹ Under the final recommendation of the Commission, cars would be charged \$8 between 6 am to 6 pm on weekdays to drive in Manhattan south of 60th Street.²²⁰ Trucks would pay \$21, except for those meeting more stringent emissions criteria, which would be charged \$7.²²¹ Drivers could make additional trips in and out of the congestion zone at no additional charge after initially paying the fee.²²² Most importantly, the funds raised from the congestion charge will be dedicated to capital investment for public transportation;²²³ the Commission estimates its plan will raise \$491 million annually for transit projects.²²⁴

Next, the traffic mitigation law requires the Commission's final recommendation be then adopted by the City Council and the New York State Legislature by March 31, 2008.²²⁵ In order to be eligible for \$354 million in federal funds from the Department of Transportation, New York must implement a congestion pricing scheme before March 2009 and subject it to a year and a half long pilot program.²²⁶ The vast majority of this money would be devoted to improving the city's public bus system; only \$10 million would be allocated for purchasing the necessary computerized equipment for imposing the fee.²²⁷ Governor David Paterson, who was sworn into office after the resignation of Eliot Spitzer, has expressed unequivocal support for congestion pricing by submitting a Governor's program bill that embraces the Commission's final recom-

217. N.Y. Laws 384, at §§3-4; *see also* Neuman, *supra* note 216 at B2.

218. Neuman, *supra* note 216, at B2; *see also* Congestion Mitigation Commission, *Congestion Mitigation*, https://qa.nysdot.gov/programs/congestion_mitigation_commission (listing a roster of the Commission) (last visited Sept. 29, 2008).

219. N.Y. Laws 384, at §5.

220. REPORT TO THE TRAFFIC CONGESTION MITIGATION COMMISSION & RECOMMENDED IMPLEMENTATION PLAN 64 (2008), *available at* <https://www.nysdot.gov/portal/page/portal/programs/repository/TCMC-Final-Report.pdf>.

221. *Id.*

222. *Id.* Additionally, any tolls paid on Port Authority bridges or tunnels via E-ZPass would be subtracted from the applicable congestion fee. *Id.*

223. *Id.* at 68.

224. *Id.* at 64.

225. N.Y. Laws 384, at §6; *see also* Confessore, *supra* note 215 at B5.

226. William Neuman, *New York to Get U.S. Traffic Aid, But With Catch*, N.Y. TIMES, Aug. 15, 2007, at A1.

227. *Id.*

mendation.²²⁸ While the New York City Counsel upheld its end of the bargain by adopting the Traffic Congestion Mitigation Implementation Plan at the end of March 2008,²²⁹ the proposal died in the backrooms of the New York State Assembly and Senate without a vote.²³⁰ The failure of the complicated legislative compromise resulted in the estimated loss of \$354 million of federal funding.²³¹

In preparation for the 2008 Olympics, Beijing experimented with a traffic control that restricted automobiles in the city based on their license plate registrations. From August 17th to August 20th, drivers were allowed vehicular access to Beijing according to the last digit of their license plate number: Friday and Sunday were reserved for even numbers and Saturday and Monday were limited to odd numbers.²³² Beijing Police imposed a fine of 100 yuan (\$13) for any individual violating the policy.²³³ The regulation was intended to remove 1.3 million cars from the road, improve air quality and increase public transit ridership by 2 million during the four days.²³⁴ Additionally, 200,000 private car owners have signed a pledge not to drive during all four days as part of a “green commuter” movement.²³⁵

After the trial period, Chinese officials estimated that automobile emissions were diminished up to 20%, the number of automobiles driven was reduced by a third and more riders utilized public transit.²³⁶ Beijingers overwhelmingly supported the plan and believed that such controls were necessary to address traffic congestion both before and during the

228. Press Release, Governor Paterson Announces Support for Traffic Mitigation Plan (Mar. 21, 2008), available at http://www.ny.gov/governor/press/press_0321081.html.

229. 2007 N.Y. Laws A09362, S. Assem., Reg. Sess. (N.Y. 2007).

230. Nicholas Confessore, *\$8 Traffic Fee for Manhattan Fails in Albany*, N.Y. TIMES, Apr. 8, 2008, at A1.

231. *Id.*

232. Liu Weifeng, *Vehicles Ordered Off Road for Drill*, CHINA DAILY, Aug. 10, 2007, available at http://www.chinadaily.com.cn/olympics/2007-08/10/content_6021075.htm. Beijing utilized a similar regulation during the China-Africa Summit, which was held from November 1 to November 5, 2006. *China Focus: Beijing Embarks On Air Quality Test for Olympics*, XINHUA GEN. NEWS SERV., Aug. 17, 2007, available at http://www.chinadaily.com.cn/china/2007-08/17/content_6032592.htm#. When 400,000 drivers volunteered not to drive during the meeting, CO and NOx emissions were cut by 20 and 25% respectively. *Id.*

233. Zhe, *Police to Limit Traffic into Capital*, CHINA DAILY, Aug. 16, 2007, available at http://www.chinadaily.com.cn/china/2007-08/16/content_6028904.htm.

234. Xinhuanet.com, *Beijing Drives 400,000 Motorists Off Roads in Olympic Traffic Test*, Aug. 16, 2007, http://news.xinhuanet.com/english/2007-08/16/content_6547101.htm.

235. Liu Weifeng, *A Day to Use Public Transport*, CHINA DAILY, Aug. 17, 2007, available at http://www.chinadaily.com.cn/olympics/2007-08/17/content_6031448.htm.

236. Richard McGregor & Fiona Harvey, *Beijing Hails Success of Anti-Smog Trial*, FIN. TIMES, Aug. 22, 2007, available at http://www.ft.com/cms/s/0/3fd1ab5a-5047-11dc-a6b0-0000779fd2ac.html?nclick_check=1.

Olympic Games.²³⁷ There have even been calls to extend the restriction after the Olympiad.²³⁸ Other cities including Athens, Manila, Sao Paolo and Mexico City currently impose similar limits on drivers.²³⁹ However, some individuals have responded by obtaining another vehicle to avoid the regulation entirely.²⁴⁰ It is not known whether such a system will be used during this summer's Games.²⁴¹ Yet Beijing is planning to cut traffic congestion in the city by half during the Olympics.²⁴² With 3.3 million automobiles traveling Beijing's streets by August, it is estimated that 1.65 million cars and trucks would have to be banned from city roads.²⁴³

Whether it is through the hosting of the Olympics Games, the courts or a competitive grant process, each of the countries presented in this study have realized, albeit to different degrees, that public transportation should be an integral part of any comprehensive strategy to promote a cleaner and healthier society. While these countries should be applauded for making public transit a more feasible option for individuals, a progressive transportation policy must also address the other side of the equation – increased worldwide demand for the automobile. Congestion pricing should be implemented along with improvements in transit infrastructure because it presents a disincentive for motorists who would otherwise drive in the world's most crowded and polluted urban areas while providing a steady revenue stream for additional public transportation investments. Despite the recent failure of congestion pricing in New York, the proven and well-established environmental benefits of public transportation can be best realized with this diverse approach.

237. Wang Ying, *Beijingers Endorse Traffic Controls*, CHINA DAILY, Aug. 24, 2007, available at http://www.chinadaily.com.cn/cndy/2007-08/24/content_6038450.htm. Eighty-nine percent of the over 1000 Beijing residents polled via telephone supported the traffic restrictions. *Id.* "Beijing Social Facts and Public Opinion Survey Center conducted the survey". *Id.*

238. *Build On Air Quality Exercise*, CHINA DAILY, Aug. 21, 2007, available at http://www.chinadaily.com.cn/opinion/2007-08/21/content_6034888.htm.

239. McGregor & Harvey, *supra* note 236; Weifeng, *supra* note 232.

240. McGregor & Harvey, *supra* note 236.

241. Jim Yardley, *supra* note 32 at A18.

242. *Id.*

243. *Id.*