

## **The Right Direction for Transit: Invest Wisely and Manage Well**

The United States have experienced a rapid growth of investment in transit since the beginning of federal transit assistance landmarked by the passage of the Urban Mass Transportation Act (UMTA) in 1964<sup>1</sup>. Usually, transit expenditures can be divided into two major categories: capital costs and operating costs<sup>2</sup>. Capital expenditures, which have long received favorable federal contributions, mainly comprise the “hardware”, or infrastructures, of transit systems. There are several types of transit capital investments, each with different levels of expenditures and impacts: (1) new system investment, with expenditures for land acquisition, engineering and all system components; (2) modernization, with expenditures for replacement or rehabilitation of system components; and (3) expansion, with expenditures for additions to existing service, scope and range of which varies greatly<sup>3</sup>.

Transit has received extremely high expectations from policy makers since its boom in the 1960s and 1970s. Investments in transit have been advocated as a tool for urban redevelopment, “as a solution to air pollution and highway congestion, as a means to conserve energy and reduce urban sprawl, and as a way of providing mobility to the poor, the elderly, and the handicapped”<sup>4</sup>. However, whether or not transit can serve all these objectives, especially in an effective manner, is often a topic of hot debate. This article provides a review on the initiatives and current issues of the transit capital investment policies. The focus is placed on the federal transit assistance policies, which play a guiding role in the local transit investment decision-making<sup>5</sup>.

Specifically, part I reviews the initiatives and development of federal transit assistance policies. Also examined in this part are the current issues associated with the expanding transit investments. Part II provides an evaluation on the effectiveness of policies on transit capital investments. The article concludes that, transit investment, as a tool for realizing people’s multiple objectives, bears its merits and limitations. Whether or not it can effectively serve policy objectives depends on how people apply it into different local contexts. Simply criticizing transit’s paleness in realizing policy objectives runs the risk of ignoring the real latent problems: what really matters is to wisely tailor transit investments into the local markets, as well as to pursue better management of the built system, which is equally important in realizing investment objectives.

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<sup>1</sup> The UMTA of 1964 authorized \$375 million in capital grants for qualified transit project (Black 1995); In 1970s transit program grew overwhelmingly, with government transit assistance increasing in 10-fold from \$540 million in 1973 to \$5.2 billion in 1978 (Fielding 1995); The ISTEA of 1991 authorized dedicated expenditures of \$31.5 billion to transit program (Black 1995); The TEA-21 of 1998 guaranteed “transit capital investment grants and loans” with \$16.9 billion (USDOT 2002)

<sup>2</sup> Martin Wachs 2001

<sup>3</sup> See CSI 1999 Page 1-1

<sup>4</sup> Fielding, 1983

<sup>5</sup> According to a survey research conducted by E. Deakin, et al. (2002), “most (local) transit agencies use federal guidance and regulations on the evaluation of transit investment as a starting point”.

## **Part I Policy Overview**

### **Policy Initiatives through the History**

Federal transit assistance in American began as a minor element of the urban renewal program, grew rapidly in the 1970s, and since which has expanded for three decades into the transit industry today<sup>6</sup>. The motivations of federal transit assistances evolved with the shifting concerns and interests, which can be reflected in the following major policy landmarks:

- (1) *Prior to 1960s*, transit received little federal support. However, during Roosevelt administration, many important transit projects were financed through the Public Works Administration (PWA) with the aims to assemble “a broadly based federal effort to combat the impact of the great Depression by encouraging investment in public works”<sup>7</sup>.
- (2) The federal transit assistance program was established *in 1960s*<sup>8</sup>, embracing the idea promoted by Kennedy Administration: national welfare requires “properly balanced use of private vehicles and mass transportation to help shape as well as serve urban growth”, to promote economic efficiency and livability in areas of future development<sup>9</sup>.
- (3) *During 1970s*, the adverse impacts of auto use and interstate construction came into play, shifting people’s attentions to transit as a solution to various auto related problems of air pollution, energy conservation, and highway congestion. Federal transit assistance grew rapidly in 1970s to “the largest discretionary program in the domestic budget”<sup>10</sup>.
- (4) Transit expansions continued in the *1980s*. The passages of the ISTEA in *1991* and the later reauthorization TEA 21 of *1998* provide transit with not only higher-than ever dedicated funding, but also authorized flexible use of additional funds for either highway or transit use. Simply speaking, the initiatives behind both ISTEA and TEA 21 are mobility improvements, environmental benefits, and economic efficiency of growth through a balanced “intermodel transportation system”<sup>11</sup>.

### **Dilemmas in Transit Spending Expansion**

Four decades expansions and experiences of federal transit investments have been accompanied with continuous concerns questioning the capability of transit in serving the proposed objectives: urban vitalization, environment protection, highway congestion, energy conservation, and equity promotion. Before addressing the issue on the effectiveness of transit investment policies per

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<sup>6</sup> Fielding 1995

<sup>7</sup> FTA Website. Available at <http://www.fta.dot.gov/docs/firstinvest.html>.

<sup>8</sup> With the passage of UMTA of 1964 by Johnson Administration

<sup>9</sup> FTA Website. Available at <http://www.fta.dot.gov/docs/firstinvest.html>.

<sup>10</sup> Fielding 1995

<sup>11</sup> O’Toole 1997

se<sup>12</sup>, political problems or influences can be found in the administration of federal transit assistance programs, which not only partially accounted for the rapid expansion of transit spending, but also are the factors that have complicated and disturbed the sound application of the policies. Listed below are three of the problems or political influences:

(1) Free money disadvantage

Federal assistance normally accounts for half of the transit capital costs with requirement that local government agencies match roughly the other half. Local elected officials frequently choose to make larger capital investment than are justified by local conditions to take advantage of federal funding<sup>13</sup>.

(2) Constituency bias

Many private systems in small and medium sized cities have passed from private to public ownership assisted by federal grants, which expanded transit constituency in Congress, enabling representatives from these cities to gain tangible benefits for their constituents by supporting requests for additional money<sup>14</sup>. As Fielding (1995) put it, “Too often, transit was developed for someone else to use by interest groups who had other objectives.”

(3) MPO bias

Since the ISTEA of 1991, metropolitan planning organizations (MPO) have been given authorization to coordinate the highway and transit spending. Since MPOs are central city oriented, additional transit investment is more likely than normal to happen<sup>15</sup>.

Part of the results from these problems is the predominant support for rail system in the US, despite various studies demonstrating that busways and ride sharing are more cost effective and suitable to American cities than rail transit<sup>16</sup>.

## **Part II Policy Evaluation**

### **Evaluation**

In this part, the effectiveness of the federal transit assistance policies will be evaluated based on four goals or premises of a preferred land use and transportation system: efficiency, equity, environment, and experience<sup>17</sup>.

#### A. Efficiency

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<sup>12</sup> The effectiveness of transit investment policy will be discussed in the next portion.

<sup>13</sup> Martin Wachs 2001

<sup>14</sup> Fielding 1995

<sup>15</sup> Fielding 1995

<sup>16</sup> See studies by Pickrell (1992), and Morrill (1991)

<sup>17</sup> D. Levinson, and K. Krizek (2003)

At the national level, a study conducted by the Cambridge Systematics, Inc. in 1999 reaffirmed that transit investment has significant positive economic impacts on jobs, business revenues, and a variety of broader indirect benefits<sup>18</sup>. However, aggregated analysis would inevitably distort the picture, because the impacts of transit investment vary from region to region based on different local conditions. Normally, measuring the efficiency of transit expenditures covers the following issues of concerns:

### (1) Ridership

Transit investment could be effective in gaining ridership in certain conditions. Pushkarev and Zupan (1977) conducted a comparative statistical analysis on several urban areas, concluding that transit is most effective in markets 1) for work trips to the CBD and to schools and colleges; 2) for travel by persons from low-income households; and 3) transit does best in high-density neighborhoods and along radial corridors connecting the suburbs with the CBD or other commercial mega centers<sup>19</sup>.

### (2) Congestion relief

Congestion relief is a typical reason for promoting transit. Studies have showed that transit is effective in reducing congestion during peak periods<sup>20</sup>. However, this is not to say transit can substantially reduce congestion, because there is an effect of latent demand: to the extent that a new transit service draws people out of cars, others might take advantages of reduced highway congestion to make more trip<sup>21</sup>.

### (3) Cost effectiveness

There is often a concern that the bus systems have cost more and carried fewer riders than forecast, which leads to larger subsidies than anticipated. Here, as discussed above, bus ridership varies from region to region depending on different conditions. Transit costs a lot because it is a labor-intensive industry<sup>22</sup>, and labor productivity and efficiency are normally limited by the complex union rules<sup>23</sup>. Thus, the cost effectiveness of a transit investment would also depend on the improvement of labor productivity<sup>24</sup>.

## B. Equity

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<sup>18</sup> See CSI 1999 pp. E-1. The data for the inputs of the analysis were gathered from sources including APTA reports on transit funding needs and the FTA's National Transit Database

<sup>19</sup> Pushkarev, Zupan (1977)

<sup>20</sup> See Fielding (1995) pp. 298. Studies showed that arterial roads would be more congested and commute times far longer and more troublesome if transit were not attracting some commuters.

<sup>21</sup> Wachs 2001

<sup>22</sup> Normally three-fourths of operators' budgets are devoted to wages and benefits. See Wachs 2001

<sup>23</sup> For example, while it might be efficient to have a driver work during peak hour and rest during the mid-day, union rules preclude split shifts and require overtime payment over eight hours. See Wachs 2001

<sup>24</sup> One way of improving labor productivity is to privatize transit services making it possible to use part-time drivers. See Wachs 2001

Equity is clearly a function that transit is invested to serve. Equity issue in transit is difficult to address partly due to the ambiguity of the definition or assessment methods for the term “equity”. Roughly speaking, equity in transit investment could mean two folds: 1) the suitable service provision to the transportation-disadvantaged population, or those who choose not to drive; and 2) fair share of people’s payments to and benefits from the transit infrastructures<sup>25</sup>. The former required transit to meet the specialized needs of different disadvantaged people; the latter sometime calls for spatially equal location of transit services, because American cities are often spatially segregated by race and class.

Take the Twin Cities as an example, in 2001, 64 counties and nine municipalities of the Twin Cities have public transportation services, leaving only seven counties without service<sup>26</sup>, which indicates a equally distribution of transit service. However, studies also show that there remain unmet special needs in some areas by different transit dependent groups.

### C. Environment

Transit investment can help protect environment through improving air quality and energy efficiency. However, this is not automatically true: exhaust from diesel buses would worsen air quality with fewer than a dozen riders; similarly, energy efficiency of bus system can only be realized with a certain level of patronage; rail system are more energy efficient, while the construction of a rail system is energy intensive<sup>27</sup>. Thus similar conclusion can be reached that the effectiveness of transit investment to promote environmental quality depends heavily on the market potential, or the level of ridership.

### D. Experience

Experiences of transit investment vary from region to region. Transit investments could lead to various results in different cities depending on their differences in a variety of factors, very important of which is how the transit investment is balanced and tailored to better suite the local condition. The different experiences in Portland, Oregon vs. San Diego, California might well illustrate this point.

Portland demonstrated an experience of “politically inspired investments”: the local government officials had aggressively sought federal funding to improve transit and revitalize their city. Between 1970 and 1976, miles of service increased by 178%, while operating expenses grew in fivefold, leading to revenue decrease to less than 40% of operating costs and a ratio of 31% in

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<sup>25</sup> David C. Hodge 1995

<sup>26</sup> MnDOT 2001

<sup>27</sup> Energy resources consumed in construction may take 45 years or more to recover through energy savings. See Fielding (1995)

1980s. Transit investment did create a charming CBD for Portland, while the transformation has been achieved at a very high cost<sup>28</sup>.

Contrary to Portland, government officials in San Diego declined federal assistance for constructing a light rail line to Mexican border and avoid the excessive cost of new rail transit system. Instead, they purchased an existing rail right-of-way, used existing signaling technology, and purchased rail cars. The project completed within five years, and fares covered the operating costs, and the line also demonstrated positive impacts on the CBD<sup>29</sup>.

The Twin Cities also have some positive experiences in transit investment. Between 1970 and 1980, the twin cities' spending on service development programs has increased the service reliability, which reversed the original declining transit patronage and led to an increase of transit work trips from 8.5% to 8.7%<sup>30</sup>.

## Conclusion

Transit is no panacea to lists of urban problems as it is widely expected to be. Transit investment in itself can be viewed as a tool, the successful application of which depends on how people used it within the context of different physical and political conditions. Additionally, no tool can stand alone to serve multiple objectives. Transit investment can best serve the needs of a city with the combination of suitable investment decision and better management of the recurring system.

In view of these, an evaluation of transit investments makes the best sense within a certain context: San Diego's success would not necessarily be so in Portland; the burden of transit's labor-intensiveness in the U.S. could be a great benefit of low-income job creation in China. If rated on a scale of 1 (High) to 4 (Low), the Twin Cities' transit system could get a 2, considering 1) its concentrated bus services for work trips to the CBDs and to the University; 2) its different transit management system to serve the suburban areas<sup>31</sup>; 3) its good coverage of services over the Metropolitan areas, while its remaining unmet specialized needs from transportation disadvantaged people; and 4) its ridership increases experienced especially in 1998 and 1999<sup>32</sup>.

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<sup>28</sup> Also, heavy transit investment did not solve the city its congestion problem; proportion of workers using transit only increased from 6.0% to 6.2%. See Fielding (1995)

<sup>29</sup> Fielding (1995)

<sup>30</sup> Fielding (1995)

<sup>31</sup> Transit services in the suburban areas are normally served by contracting out to private providers, or served by various local agencies.

<sup>32</sup> Metro transit ridership jumps 6.4% in 1998 and another 8.9% in 1999.

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