

Financing Public Transit in the US, Sweden, and the UK

Azad Abdulhafedh

Abstract—Public transit systems have become a part of daily life in the US and around the world. Public transportation provides people with mobility and access to employment, community resources, medical care, and recreational opportunities. It benefits those who choose to ride, as well as those who have no other choice. The incorporation of public transportation options and considerations into broader economic and land use planning can also help a community expand business opportunities, reduce sprawl, and create a sense of community through transit-oriented development. By creating a locus for public activities, such development contributes to the development of the community and can enhance neighborhood safety and security. For these reasons, areas with good public transit systems are economically thriving communities and offer location advantages to businesses and individuals choosing to work or live in them. Public transportation also helps to reduce road congestion and travel times, air pollution, and energy and oil consumption. To better explore the transit funding and subsidies, and its workflow, this paper addresses the financing of public transit in three developed countries, namely the US, the UK, and Sweden.

Index Terms— Public Transit Finance, The US Department of Transportation, Federal Transit Administration, Rikstrafiken, The UK Department for Transport, Fuel Tax, Property Tax.

INTRODUCTION

Public transportation improves the quality of life in communities by providing safe, efficient and economical services. It also serves as a vital component necessary for a healthy economy. Not only does public transit benefit the people who use it, it also benefits society as a whole. Public transportation facilities and corridors are focal points for communities that serve to encourage economic and social activities and help create strong neighborhood centers that are economically stable, safe, and productive. When commuters ride public transportation or walk, their contact with neighbors tends to increase, which helps bring a community closer together. Public transportation has a major impact on land use development patterns. In many situations, improved accessibility can stimulate development location and type. As a strategy in relieving congestion, public transit can be more effective with policies and actions that expand transit oriented development or provide for mixed-use and pedestrian design in development of major public transportation corridors. Transit-friendly walkable communities reduce reliance on cars and promote higher levels of physical activity.

- Azad Abdulhafedh, PhD in Civil Engineering. Email: asa8cd@mail.missouri.edu

The following points summarize some benefits of the public transportation [1] [2] [3]:

- Public transportation provides personal mobility and freedom for people from every walk of life.
- Public transportation provides access to job opportunities, as well as a transportation option to go to school, visit friends, go shopping, or go to a doctor's office.
- Public Transportation saves money, and enhances the quality of life.
- Public transportation provides an affordable, and for many, necessary alternative to driving.
- Transit availability can reduce the need for an additional car, and hence, make savings in a household budget.
- Public Transportation provides economic opportunities. For instance, real estate residential, commercial or business that is served by public transportation is valued more than similar properties not served by transit.
- Public transportation enhances local and state economic growth in many ways, such as shopping malls, restaurants, and medical facilities.
- Public transportation encourages land-use programs that generate synergies and create a range of housing types, from single-family homes to apartments, to accommodate diverse incomes and family structures.

- Public transportation revitalizes neighborhoods, increases social interaction and pedestrian activity, and enhances safety. For example, when commuters ride public transportation or walk, contact with neighbors tend to increase, ultimately helping to bring a community together.
- Public transportation generates a financial return for communities and businesses as well as individuals that can be captured and invested in housing, amenities, and parking.

PUBLIC TRANSIT FINANCING IN THE USA

The US transit systems receive funds for transit primarily through the U.S. Department of Transportation and the Federal Transit Administration. The U.S. Department of Transportation (DOT) offers several financing programs that may be used by recipients of federal transit funding, such as the Transportation Infrastructure Finance and Innovation Act [1]. The Federal Transit Administration (FTA) provides financing eligibility within its grant programs for the use of revenue bonds, such as fare box revenue bonds and grant anticipation notes, debt service reserve financing, and capital leasing. The DOT awards credit assistance to eligible applicants, which include state departments of transportation, transit operators, special authorities, local governments, and private entities. Mechanisms to leverage federal aid are designed to provide states with greater flexibility in managing federal-aid highway funds. The principal objective of the management techniques is to ease restrictions on the timing of obligations and reimbursements and create a broader range of options for meeting matching requirements. While finding money for projects is always a challenge, states and other project sponsors also have to align the flow of projects with the availability of local funding. Grant management mechanisms provide state and local agencies with cash flow tools helping them to leverage Federal funding and expedite the implementation of projects. As is the case with state highway programs, state transit programs receive a large percentage of funding from federal sources. This funding is in turn awarded in the form of grants that typically require matching funds depending on the type of program, to individual transit systems by formulas which may vary from year to year. States generally do not own capital equipment for transit and do not provide direct transit services. State and federal funds are disbursed to cities, counties, transit authorities and transit providers on a reimbursement basis, so expenses must be incurred by the provider prior to disbursement by the State or the Federal Transit Administration [1] [2]. There are some differences in

how states choose to finance transportation improvements. Some states extend the payment for new improvement projects into the future through bond financing, while others operate on a pay-as-you-go basis. Transportation project sponsors in the United States utilize a variety of mechanisms to finance their project's capital and operating costs. Traditional methods used to fund public transit range from user fees (i.e. fare revenues) to taxation. As single sources are often insufficient to cover a project's capital and operating costs, multiple sources are bundled to create funding packages. The following funding approaches are used in the US[2] [3]:

- Fare box, which are generated directly by a transit system.
- Advertising/Sponsorship, which typically falls into two categories; (i) the media value of the advertising within, and the vehicles and/or facilities; and(ii) concession agreements and rental fees on station stops.
- Motor Vehicle Fuel Tax, which is the most prominent revenue stream for transportation and can be assessed at the local, state and federal levels. The Federal gas tax is the primary funding source for the Highway Trust Fund, which funds federally, approved highway, roadway and bridge improvements. A smaller sub-account of the Highway Trust Fund, the Mass Transit Account, uses a portion of the gas tax revenue to fund public transportation projects [3].
- Property Tax, which try to link between land values and accessibility. The more connected, or accessible, a parcel of land is to centers of economic activity, the greater its value will be [3].
- Special-Purpose Local-Option Sales Tax (SPLOST), which are sales taxes imposed by a jurisdiction on itself for retail goods and services [1] [2].
- The Federal Transit Administration's (FTA) Section 5307 that provides capital and operating assistance for urban areas with populations between 50,000 and 200,000. Urban areas of any size may use Section 5307 funds for planning, engineering design and evaluation of transit projects and other technical transportation related studies, usually through local Metropolitan Planning Organization (MPO) [1] [2].
- The FTA Section 5309, which contains three primary capital assistance programs: bus and bus facilities replacement, modernization of existing rail systems, and new fixed guide way systems, commonly referred to as the New Starts program. Eligible recipients for 5309 include transit agencies at the state, regional, or municipality levels [1] [2].

- The Congestion Management and Air Quality Improvement Program (CMAQ), which is jointly administered by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). This program provides funds for State departments of transportation (DOTs), MPOs, and transit agencies in an effort to reduce air pollution and traffic congestion in metropolitan areas [1] [2] [3].
- Parking taxes, primarily congested urban areas where parking is at a premium.
- Payroll Taxes, which are usually subject to voter approval at the local level [2] [3].
- Rental Car Taxes, which are used in many cities to supplement existing general local and state sales taxes.
- Motor Vehicle Registration Fees and Excise Taxes. Annual vehicle registration fees are typically assessed as a simple flat fee per vehicle registered, while excise taxes are variable based on vehicle make, model, year, and value, among other possible factors [1] [2].
- Community and Business Improvement Districts (CIDs/BIDs), which are a form of public-private partnership to raise bonds for transportation improvements including transit [1] [4].

Public Transit Financing in Sweden

In Sweden there is a growing interest in public transport. It is well known that until 1985 the Central government concentrated all the responsibilities for the provision of public transport. Then, these responsibilities were transferred to the Sweden regions, which in turn had to create a Public transport authority called "Rikstrafiken" (The Swedish National Public Transport Agency), which is an agency of the Ministry of Enterprise, Energy and Communications. The main responsibilities of Rikstrafiken are to foster and coordinate public transport throughout Sweden and to procure interregional public transport [5]. There are other agencies like Vägverket (The National Road Administration), which is responsible for planning and maintaining the strategic road network, and Banverket (The Swedish National Rail Administration), which is responsible for the operation and administration of the national rail infrastructure. In addition, there is the Statens Järnvägar (SJ), which is the state owned railway operator with responsibility for operating the strategic train service network. Sjöfartsverket (the Swedish Maritime Administration) is responsible for the waterways (extension and maintenance) and for pilotage, ice-breaking and sea charts. The relationship between the transport authority and the operators is

established by means of a public service rendering contract, resulting from a public contest. Stakeholders at the regional and local level, counties, and the municipalities, can apply for grants from the government agencies such as Banverket (The National Rail Administration) to develop their systems. The new ways of funding are often designed to have an effect to reduce travel demand and/or to steer in favor of sustainable transport modes, such as light rail [6]. The following funding approaches are used in Sweden:

- Funding of Metro, Buses and Tram network is achieved by Rikstrafiken, which receives the income from ticket sales and pays the operators according to what is stipulated in the contract, and this payment is established according to the amount and quality of the services agreed on in the contract [6]. Rikstrafiken also plans the investments in the transport system of Metro, Urban Buses and Tram. The sources of financing of the investments are Rikstrafiken budget itself, Counties Councils, external loans, leasing operations, international banks, the capital from shareholders, and contributions from the State [6].
- Funding of Local trains / regional trains is also achieved by Rikstrafiken which receives the income from ticket sales and rents the trains to the operators. The compensation for the operation is stipulated in the contract [6].
- Cross-financing, which uses the profit from public companies to cover the deficit in the public transport.
- Local taxes or fees on real estate properties.
- Local taxes or fees on companies.
- Local taxes on fuels, income or sales.
- Income from parking fees.
- Congestion charges on road traffic.
- Public-private partnership schemes.
- Leverage (loans).
- Environmental taxes on fuels and vehicles, with higher taxes on the less-clean variants.
- Introduced carbon tax on road fuels.

Public Transit Financing in the UK

The UK government funds about 45% of all surface transport expenditures and approves all local and regional transport plans [8]. However, the central government has been granting more funding authority to local governments, beginning with London, Scotland, and Wales, under the premise that local and regional authorities are most familiar with their travel needs and are better suited to integrate transport spending with other decisions on sustainable

economic development. Further devolution is planned for all regions and municipalities through the revised spatial transport planning processes. The central government is also responsible for influencing behavior through regulation, taxation and information regarding transportation. The Department for Transport (DT) sets strategy and policy for the UK transportation system, and establishes and manages relationships with the organizations that are responsible for delivery, within England and Wales. The DT's vision is of a transport system that balances the needs of the economy, the environment and society. These functions are largely devolved in Scotland to Transport Scotland, a department of the Scottish Executive, and in Wales to the Department for the Economy and Transport, a department in the Welsh Assembly Government (WAG). Responsibility for transport policy is largely devolved in Northern Ireland to the Department for Regional Development and Department of the Environment, departments of the Northern Ireland Executive. The Highways Agency (HA) is the executive agency responsible for maintaining, operating and improving the motorways and trunk road network in England and Wales, while other Executive Agencies set standards and requirements or deliver permits and licenses for road vehicles. In the rail sector, Network Rail owns, manages, maintains and renews the rail infrastructure in England, Wales and Scotland. The Office of the Rail Regulator (ORR) is the regulatory body for the industry, determining Network Rail's revenue requirement and setting rail access charges. All these functions are devolved in Northern Ireland while overall responsibility for rail strategy and funding in Scotland lies with the Scottish Executive. In the airport sector, the majority of airports are currently controlled by private companies. The Civil Aviation Authority (CAA) is the independent air regulator and advises the Central Government on air transport issues. National Air Traffic Services (NATS) is responsible for air traffic control for the industry. Canals and rivers are managed by British Waterways, a public corporation, sponsored by the Department for the Environment, Food and Rural Affairs (DEFRA) in England and Wales and the Scottish Executive in Scotland [8]. Local authorities have different functions ranging from providing, managing and maintaining the local road network and planning and financing the provision of socially necessary bus services, establishing necessary Quality Bus Partnership agreements and Quality Contracts with operators, and introducing congestion charging schemes or workplace parking levies. Currently local transport policy and funding for local transport is sought through Local Transport Plan (LTP). In Northern Ireland, this function remains with the Northern Ireland Executive. The UK

governments have increased funding for public transport throughout the last decade. The stated reasons for the increase are to catch up from years of underfunding transport; recognition of the importance of transport to the competitiveness of regions and the nation and the livability of communities; and the need to improve the environmental sustainability of the transport system. Provinces play the major role and levy a separate fuel tax. Fuel taxes raise almost \$700/year/capita in the UK, all fuels are also subject to the national value added or sales tax which is included in the taxation rates. The UK is considering shifting some of this burden from fuel taxes to kilometer taxes [8]. Public transit in the UK is funded through the following approaches:

- Rural Bus Subsidy Grant, which provides for additional local bus services to rural communities previously not well served. The grant is distributed to local authorities and allocations are based on numbers living in rural area. Decisions on which services to support are essentially for the local authority [8].
- The Rural Transport Challenge, which is an annual competition in which local authorities bid for funding for schemes aimed at stimulating innovation in the provision and promotion of rural public transport, improving quality and choice across the country. The Challenge approach enables the best ideas from local authorities to be supported [8].
- The Urban Transport Challenge, which contributes to regeneration of deprived urban areas by improving transport provision [8].
- The Bus Service Operators Grant, which tries to reimburse the major part of the excise duty paid on the fuel used in operating local registered bus services [9].
- Public-Private financing partnerships, which tries to better spread the financial risk, and lower borrowing costs [9] [10] [11] [12].
- Charges for the use of road space.
- Consumption taxes.
- Fuel taxes.
- Property-related taxes.
- Parking charges and fines.
- Congestion charges on road traffic.
- Carbon tax on road fuels.
- Federal and Local subsidies.

Comparison of Public Transit Financing between the US, Sweden, and the UK

In comparing the different ways and approaches of funding the public transit in the US, Sweden, and the UK we can see the

following findings:

1. The national or Federal share of public expenditures for public transport is about 50% for Sweden and 45% for the UK [8], whereas in comparison with the US, it is only about 20% [1].
2. The US tax per liter is only about 11 US cents, 70 cents in Sweden, and 89 cents in the UK [2] [3] [4].
3. Diesel taxes in the US and the UK are similar to those for gasoline, and are only slightly lower than those for gasoline in Sweden [9].
4. Sweden and the UK take more funds from highway fuel taxation than the US does. Sweden and the UK are considering shifting from fuel taxes to kilometer taxes [2] [3] [4].
5. The UK and Sweden have been pursuing sustainable development policies for more than two decades, and explicitly require transportation projects to contribute to environmental and social goals as well as to economic development and mobility. They rate projects on their contributions to these objectives. The US has less adopted policies that require transportation programs and projects to be sustainable economically, socially, and environmentally in both the short and the long term.
6. Compared to the UK, and Sweden, the US has substantially lower fuel taxes and fewer policies that connect transportation prices to transportation's full costs. The change in transport fuels and vehicle technologies would point to the need for a transition to other types of pricing including carbon fees, and congestion fees.
7. The US, compared to the UK and Sweden, stands out in having weak coordination of transport investments with public and private investments in urban and regional transportation infrastructure and in integrating transport investments with those in rural and urban development and redevelopment. The US lack the development of policies, programs, evaluation criteria and monitoring programs that greatly increase such coordination and therefore, should consider new institutional formats like those used in the UK, and Sweden to improve infrastructure and planning investments.
8. Sweden and the UK are ahead of the US in responding to the threat of global warming, even though US CO₂ emissions per capita are much higher. To address this

problem, the US needs to adopt lifecycle cost-effective fuel, vehicle, travel demand and urban development policies effectively deliver programs and projects supporting a sustainable high quality of life. The US also has to examine how these countries are working to relieve crowded roads of some freight by shifting to rail, which yields an important co-benefit of reducing CO₂ emissions as well.

Conclusions

Public transit is financed at the federal, state, and local levels in the US, Sweden, and the UK. The three countries depend largely on federal and local grants and subsidies, and different types of taxes are used to pay for their public transit systems, like fuel taxes and property-related taxes. However, there are differences in funding policies in these three countries towards getting sustainable transit systems. Investment policies with the public-private partnership have been found to be useful tools in financing public transit in Sweden, the UK, and the US. The UK and Sweden have responded more effectively to the global warming by more shifting their transit systems to rails in order to reduce carbon emission. Although, the fuel taxes in the US are much lower than the UK and Sweden however, the need for a transition to other types of pricing fees including carbon fees, and congestion fees is essential for financing public transit in the US.

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