

URBAN TRANSPORT IN THE 21st CENTURY

SHANGHAI MUNICIPAL GOVERNMENT

Shanghai is directly under the central Government. With the China Sea to its east, the Yangtze River to its north, the Hangzhou Bay to its south, Jiangsu and Zhejiang provinces to its west, Shanghai sits at the mouth of the Yangtze, at the junction of the east coastal economic belt and the Yangtze River basin economic belt. Shanghai covers an area of 7,823 km² and has 13 million residents. It is the most densely populated city in the People's Republic of China, with an average of 2,059 persons/km². Its urban population density is 22,553 persons/km²; its rural population density, 926 persons/km². It has a floating population of 2.5 million to 3 million. It is one of the country's most urbanized areas, becoming more so every year. In 1998, its urbanization rate was 72 percent; by 2005, it is expected to rise to 76 percent.



Shanghai is the PRC's largest economic and shipping center. At the beginning of the 1990s, the Government began to develop the cities along the Yangtze, beginning with Pudong, launching a new economic era in the Yangtze River basin. Shanghai aims to become a major international economic, financial, and trade center by 2010.

URBAN TRANSPORTATION NEEDS

Shanghai requires an efficient, modern transportation system that is convenient, comfortable, fast, and economical, and will reduce the population in the urban and central areas. The city's master plan envisions Shanghai as composed of the central urban area, new cities, and towns. The area within the outer-ring road is proposed as the site of the planned central city. The new cities (including counties) will be supported by the central and market towns. The authorities should ensure that transportation development will not harm residents' health and living conditions.

TRANSPORTATION GOALS

Shanghai's transportation goals are the following:

- Build an efficient, high-speed urban passenger transport network consisting of rail transport supported by buses and streetcars.
- Build an efficient road network, including expressways, with multilevel, well-defined functions, and proper layout.
- Build an integrated transportation system connecting Shanghai to the rest of the PRC and the world, including a deep-water container port, an international airport, a modern information port, expressways, high-speed railways, and waterways for transport use.

ACTION PLAN

Three-dimensional Road System within the Central City

INVESTMENT SITUATION

Since the 1990s, Shanghai has underscored investment in transportation construction. In 1991, investment was Y878 million; by

1998, it was Y9.6 billion, representing an average increment of 40.7 percent per year.

ROAD FACILITIES IN THE CENTRAL CITY

The 1990s have witnessed great strides in road construction in the central city, which now enjoys a three-dimensional, multilayered transportation framework. Since the inner-ring road was opened in 1994, the north-south, Cao-Min, and Ya'an elevated roads have been constructed and put into operation, as has the urban main road network grid. Since the No. 1 metro line was opened in 1995, it has grown 10 km a year. By end-2000, Shanghai will have built the No. 2 metro line and the light rail Mingzhu Line, expanding the metro from its present 21 km to 65 km. Two tunnels and five bridges have also been constructed across the Huangpu River.

Urban roads have improved immensely since the early 1990s. They increased by 40 percent from 4,820 km in 1991 to 6,680 km in 1998. In the same period, road space increased 7 percent each year to 97.6 million m², or 2.6 times, easing traffic and the pressure on transportation in the central urban area.

Urban roads will remain the main focus of transportation development in the 21st century for the following reasons:

- The surface road network is not compatible with the elevated roads, as rush-hour traffic on the main roads in the central area is often extremely heavy, crawling at about 20 km/hour.
- The roads connecting the central city with the outer areas were not systematically planned, with too-low road density often causing traffic jams on major roads.
- Pressure on transportation services will grow. By 2005 (i.e., during the 10th five-year period), the number of motor vehicles in Shanghai will increase from 700,000 in 1998 to over 1 million. In the far future, it will increase to about 2 million. The continuous outward movement of urban residents will also increase traffic in the outer areas.

ACTION PLAN

Shanghai's 10th five-year plan emphasizes construction and completion of the three-dimensional urban transport system composed of a network of expressways, trunk roads, subtrunk roads, and branch roads. The city's main tasks are the following:

Complete the surface road system of the central city. Add a subtrunk network to the existing trunk network to improve the urban road network's grade ratio. Expand the subtrunk network and complete the nonmotor road network to increase main road capacity and maximize the use of the existing road network. Construct and rehabilitate 377 km of urban roads, construct 26 fly-over bridges, open 120 km of new bus routes, and rehabilitate 170 km of branch roads.

Widen some radial roads. Link the inner- and outer-ring roads with 13 radial roads and 1 high-speed auxiliary ring road, forming a network radiating from the central city to the rural areas, towns, and other provinces, and reducing travel time between the inner- and outer-ring roads to no more than 20 minutes. Major projects between the inner- and outer-ring roads include the Gonghe Xin Road interchange, the interchange at the crossing of Wuning Road and Cao'an Road, and the second stage of the Huming elevated road.

Build more metros. The rail transport network will consist of the following:

- the rail transport system in the central city, including the metro, light rail, and streetcars;
- the high-speed urban railway system between the central city and nearby towns;
- the suburban railway system between the central city and other towns; and
- the railway system between Shanghai and other provinces.

Eleven metro lines, each about 30 km long, or a total length of 329 km, and seven light rail systems of about 19 km each, or a total length of 133 km, are to be built in the central city. Before 2005, a 130-km-long railway network is to be completed, with the rings constructed first, followed by the radials. The second stage of the light rail Mingzhu line will be built first, followed by the extension of the two metro lines, the Xin-Ming line, the AA line in Pudong, and the CC line in Zhongyuan.

River-crossing projects will be continued, with two or three completed under the 10th five-year plan. Although the No. 2 metro line will have a large carrying capacity, high-speed transportation corridors between Puxi and Pudong, which are west and east of the Huangpu River, respectively, the river's 113-km-long bank will require more river crossings.

Speed Up Construction of Expressways

Expressways are important in Shanghai for the following reasons:

- Shanghai needs convenient and efficient links with its surrounding areas.
- It needs close and high-speed links between the central city and the planned new cities and towns.
- As an international shipping center, it needs high-speed and convenient links with the hinterland.
- Highway transportation offers flexibility, door-to-door service, and high speed. It also serves a vast area and has a large carrying capacity.
- Existing expressways cannot meet the requirements of urbanization or of economic development in the Yangtze River delta because they are small-scale (91 km total or only 2.2 percent of the total length of Shanghai's highways) and poorly connected.

ACTION PLAN

The construction target for the expressway network is summarized as “15-30-60”:

- The expressway network should be reached within 15 minutes from major industrial areas, market towns, or transport hubs.
- Any of the new cities, nine municipal industrial zones, or major transport hubs should be no more than 30 minutes away from the central city.
- It should be possible to go from any point to another within the network in 60 minutes or less.

The Shanghai expressway network will be built by 2010. It will have seven radial roads and an outer-ring road, with a total length of 650 km, including 343 km of new expressways and 220 km of existing roads upgraded to expressways. It will have four- and six-lane roads.

Reorganization of Urban Transport Structure

Although Shanghai's transportation facilities have increased rapidly, it has little public transportation compared with other big cities. The No. 1 metro line carries about 350,000 passengers per day. Buses have increased from 7,000 in 1991 to 15,000 in 1998. Bus lines have increased from 400 to about 1,000. Still, in 1995 only 26 percent of Shanghai's residents were taking public transportation.

Rail transportation serves only 5 percent of the riding public. Around 64 percent of residents travel by nonmotor-driven transportation, which hardly matches Shanghai's image as a busy metropolis. Except for bicycles, nonpublic transportation causes far more serious pollution than public transportation.

PRINCIPLES OF STRUCTURAL ADJUSTMENT

Densely populated urban Shanghai has the greatest demand for passenger transportation among Chinese cities. The following principles should therefore guide the development of its transportation system:

- Give priority to public transportation.
- Maximize efficiency of transportation facilities.
- Provide the best transportation environment by minimizing pollution.

Structural Adjustment Options

Shanghai's basic transportation development policy is to optimize and develop public transportation and to guide and control nonpublic transport. Its options are the following:

- Exert all efforts to develop rail transportation.
- Optimize surface transportation.
- Control the number of cars.
- Control mopeds and motorcycles.
- Encourage cyclists and residents in general to use public transportation.

Action Plan

- Speed up the construction of rail transportation, including the metro, light rail, and others. Increase daily passenger volume from 350,000 to 2.5 million or 20-25 percent of the riding public.
- Optimize the public transportation network by
 - solving the problem of uneven density, and
 - connecting surface with rail transportation.
- Give public transportation priority in road use. Reduce travel time. By 2005, make it possible to reach any important ur-

ban location from within the outer-ring road within 60 minutes.

- Speed up the construction of public transportation terminals and transfer hubs. Bring together as many public transportation lines as possible in one stop or terminal.

NECESSARY POLICY MEASURES

Unify the management system. All management agencies should pool their efforts to develop urban transportation.

Introduce market mechanisms to expand urban transportation and to make it more efficient. In 1996, Shanghai carried out surface public transportation reform by establishing several autonomous public transportation companies. It created a competitive environment in which several companies provide public transportation. At the same time, it allowed market forces to function by abolishing the monthly ticket, which was, in effect, a subsidy. These reforms have greatly reduced government subsidies to public transportation, increased the economic benefits of the public transport companies, and greatly improved service.

However, it is still necessary to increase the role of market forces in construction and operation, and to further reduce costs and improve service by doing the following:

- Lessen government's involvement in the sector in order to encourage public transportation companies to become independent.
- Open up the sector to private enterprise by allowing exclusive operating rights and by setting up a bidding system for line operation.
- Increase competitive bidding in construction of transportation facilities.

Raise construction funds through multiple channels and invest more in urban transport. Thanks to investment and financial reform of the

last 10 years, Shanghai enjoys the support of the municipal and district (county) governments, investment companies, foreign and local enterprises and individuals, among others. Investment comes from the government, foreign and local capital markets, the transfer of exclusive operating rights of transportation facilities, big enterprises, and financial institutions at home and abroad. It is necessary to (i) access nongovernmental funds; (ii) develop multifinancing modes, including direct financing; (iii) encourage foreign and local enterprises to invest; (iv) raise funds from the capital market; (v) privatize urban transportation; (vi) allow individual direct investment; and (vii) promote project financing.

CONCLUSION

The urban transportation problem can be solved by bringing together the efforts of government, the private sector, and the public, and by closely coordinating transportation policy, planning, construction, and management.

Since the 1990s, Shanghai has focused on providing road transportation and on reforming the public transportation sector. Its rapid economic development has given rise to greater transportation requirements in the 21st century. Through its endless efforts, Shanghai will meet its people's needs while promoting its economic and social progress.

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