Exploration of Equity in Transportation Service by Providing Dial-a-Ride System for Vulnerable Group

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Abstract. This study is to explore the equal opportunity for vulnerable group to enjoy the same transportation services as general public do by provision of dial-a-ride system. Unlike the general definition the vulnerable group in this study is defined a group of people who can’t enjoy same right to access public transit service as general public do.

The very reason to initiate dial-a-ride system for the vulnerable group is to address the needs to provide separate service for them and raise awareness of importance to build Dial-a-ride at local, regional and nationwide levels. The utmost importance of the study is to enhance the awareness of elected officials and transportation planners on the equity in transportation services.

Dial-a-ride system has been developed maturely in some European countries and the USA. Dial-a-ride is a type of transportation service in paratransit system for ride-sharing purpose as well as for the disable group who can neither access to car nor public transit. This system mainly depends on the mini bus with neither a fixed line nor fixed time schedule. Dial-a-ride system itself can be more flexible so that it can meet special transportation demands as compared to general public transit. In general this system can be the complement of public transit. At the very beginning DAR system is used for the general groups. However DAR is also designed for providing transportation service for vulnerable groups such as aged and disable people. The system consists of reservation, specialized vehicle delivery, professional care and other relative services.

With the development of civilized society, we should pay more attention to the vulnerable group when we try to allocate social resources equally. Vulnerable group is in this study defined a group of people who can’t enjoy same right to access public transit service as general public do. According to this, the purpose of establishing a dial-a-ride system for vulnerable groups is to make vulnerable groups enjoy the same transportation service as other commuters. The motivation behind conducting this study is to address the needs to provide transportation service system for vulnerable group and raise awareness of importance to build DART at local, regional and nationwide levels.

Although the vulnerable groups in Beijing are quite large, dial-a-ride services have not been established, yet. From observation it is found that the existing public transit can’t come up with good services for the disable people. With regard to this situation the objective of this paper attempts to explore the build-up of dial-a-ride service for disable people from the following five aspects.

First thing is budget. Dial-a-ride belongs to welfare type of thing for the public. Therefore, this system should enjoy receiving financial aid from all levels of
governments as subsidy. Second thing is to work out system planning for dial-a-ride from transportation point of view. Regional as well as local centers should be set up to plan, design and manage dial-a-ride services for the city of Beijing because Beijing itself has more than 1 million disable people. The third thing is to conduct comprehensive training for operators. Since the service receivers are disable people it is necessary to provide technical and management training for the drivers and staff workers. The fourth thing is to set policy to make this system work. The last thing is the publicity of dial-a-ride service. Actually, publicity is the guarantee of the former four steps.

It is our responsibility to make the vulnerable group enjoy the convenient services provided by civilized society. Apart from that the group can be treated equally in their choice of travel means. It is believed that dial-a-ride will become a part of our urban public transit systems and function as a demand-response system for fulfilling the travel desire of vulnerable group.

Introduction of Dial-A-Ride in Western Countries

In order to meet the increasing requirements of travel for all walks of life, more convenient as well as human-oriented transportation service is needed. Regular public transit system can play important key for people to satisfy their travel purpose. However, due to the limited capability of regular public transit some disable people still can’t easily and comfortably access to public transit. On the basis of making it more convenient for such group of people to travel from one place to the other, a new kind of transportation has been bored. Dial-a-ride, one type of semipublic paratransit, is designed to meet the special requirements for people who can’t access auto and are not easily use public transit.

Intelligent Para-transit service provided by Munich rail station is a good example. The buses in this system are operated on the unfixed routes according to passengers’ demands such that the connection between the station and the remote interior region has been well established [1]. As a demand-response service dial-a-ride service (DAR) plays an important role in Para-transit system. Dial-a-ride system has been developed maturely in some European countries and the USA. It can be an effective supplement for transportation system to provide more convenient transportation environment for users.

In some places such as the United States and Canada, DAR service system has been developed into a relatively high level. DAR system mainly depends on mini buses that carry passengers onto the main streets and bus stations in the city. As shown in Figure 1, DAR service has become a supplement of public transit since it is more flexible as compared with regular buses with fixed routes especially in the low density area.

![Figure 1. Passengers boarding at DART terminal.](image)

The distribution of DART (the same as DAR) sites located in the south valley in Winnipeg is shown in Figure 2. It can be seen that the DART sites have already been
so dense that it is powerful enough to constitute a Para-transit network. It can be more efficient for the unfixed-route intelligent transportation which meets special requirements of daily transportation, especially in areas with low-density population. DART service fills the gaps left by fixed-route public transportation so that it makes the whole traffic network more substantial [2]. As a consequence of enhanced accessibility, dial-a-ride is more convenient for disabled people to travel around.

Figure 2. DART 102 Southdale/Island Lakes service area map.

There is no doubt that DAR system provides necessary service of more convenient daily transportation for special group of people. One essential aspect that becomes the focus of DAR system is that DAR service can be provided for vulnerable groups. Special service provided by DAR service for vulnerable groups is aimed at making it efficient to help vulnerable people to achieve the expectation of their daily travel when their ability impedes their travel demand. The most feasible plan can be arranged about a couple of days ahead by DAR system according to the specific location and requirements needed by the users. The vehicles are specially designed to meet the need for vulnerable people, together with corresponding professional who will be distributed on time. DAR service system can be considered demand-responsive services for vulnerable groups. DAR service for vulnerable groups provides convenient services for people whose ability is limited.

**The Existing Conditions in Beijing**

In Beijing, this system has not been established so far. Based on official statistics there are more than 1 million disabled people living in the city of Beijing alone. For the disabled, the biggest difficulty in daily life is that their active ability is limited. Although we’ve already got some improvements of the service for the vulnerable groups such as special facilities in the bus, in the subway and there are about 70 taxi cabs dedicated to serve the disabled people. However, these services for the vulnerable people only can be found in some special cases. As can be seen in the city of Beijing, there are very few disabled people seen on the street, in the shopping mall, in opera house, and in the bus or subway. The direct reason is that there is no convenient conveyance to carry them to access these facilities. The existing public transit can’t provide good services for the disable people that make them to shrink back at public transit facilities.

It should be aware that the lack of specialized transportation system for the
vulnerable people is a serious social problem [3]. Considering of human nature, it can be imagined that the difficulties met by general public must be more struggling when the vulnerable groups face to. Our society is developing rapidly and great progress has been made in civilized society construction. To build up a more harmonious society, we should care about humanity as well as equity. Transportation professors as well as all walks of life should realize it is our responsibility to make the disabled people live in a society where they can be treated equally.

**Feasibility of Dial-A-Ride Built-up in Beijing**

Based on statistics, the number of the disabled in Beijing is up to 1 million that it is 5% of the total registered population of Beijing. As traffic planners and engineers it is one of the most important responsibilities to design and manage dial-a-ride system to enable the vulnerable people to enjoy the convenient and accessible transportation services. As discussed above dial-a-ride system should be the new focus of traffic planning, design, and management of Beijing. It should be noted that the requirement of the transportation for the vulnerable groups has been increasingly urgent nowadays. Meanwhile, it is believed that Beijing municipal government has the ability in terms of finance to accomplish the planning, design and construction of dial-a-ride facility. As is known 18 billion RMB ($1=6.1RMB) are invested by the government every year in public transportation construction. As complement of public transit dial-a-ride system should get some financial support from municipal government. Establishing a demand-responsive transportation services to fulfill disabled users should be a fundamental principle considered by transportation planners and designers. Technology in establishing Para-transit system for the vulnerable groups such as DAR system will fill a market gap of public transit and materially benefit disabled transit users [4~6].

**Suggestions for Dial-A-Ride Built-up in Beijing**

With regard to human nature, people may not choose to travel around once transportation in their mind is inconvenient. It is especially true for the vulnerable groups in Beijing. It is hard to imagine that the disabled people struggled in the crowded subway or buses together with other people. We have the very reason to believe that the vulnerable groups in Beijing receive no equal treatment as compared with the normal people in daily transportation services. It can be seen that it is such an important thing to establish Para-transit system for the vulnerable groups such as DAR system in Beijing to provide services. For this reason suggestions for the construction of DAR system for the vulnerable groups are as follows.

1. First of all, it is necessary to design special vehicles with professional facilities such as a ladder for wheelchairs to be moved on or off. In addition the interior and the doors of the vehicles should be particularly designed to tailor the special need for vulnerable people to use. Dial-a-ride vehicles in operation with such professional design in the United Kingdom can be seen in figure 3. According to the requirement of special design and enough space, the vehicle should be conducted to contain 10-12 people like COASTER. Besides, the vehicles can enjoy the same priority as the regular buses such as bus lanes [4, 5].
(2) The second thing is to conduct professional training for the staff workers to handle and operate the special vehicles to make sure that the staff workers can take care of the vulnerable people fully and correctly. Unlike drivers of regular buses the drivers operating special vehicles should have aptitude to deal with unusual situation. For this reason these drivers should receive medical trainings and emergence rescue trainings. What more, the knowledge of anthropology and sociology can be set up into the professional training courses. Meanwhile, the driving experience of the dial-a-ride vehicle operators should be more than 15 years to guarantee the ability to operate the vehicle smoothly and to take care of the vulnerable people. In addition, first-aid kit as well as commonly used medicine, like Glyceryl Trinitrate and Available Kyushin Pills, is necessary to be installed inside the vehicle [7].

(3) The third thing is to establish DAR service platform for the vulnerable groups by setting management office, opening the service phone lines, and laying out the pick-up places. These places areas should be located close to hospitals, supermarkets, shopping mall, pharmacy and theaters. The management office can be set up at district level such as Chao Yang. It is believed that DAR service platform will be set under the public transit system and operated within the jurisdiction of the region.

(4) The fourth thing is to set policies to guarantee the financial support as well as institutional legality in the whole urban transportation system services. It is hoped that the legal document (like ADA in USA) will be soon issued to dictate the planning and design of dial-a-ride system at local and regional levels.

(5) Finally, publicizing dial-a-ride service is needed to have the public be aware of the importance of this welfare-based service. The publicity can be made through TV program or radio or commercial activity in order to have public as well as the vulnerable groups know about how to use the service platform and how to conduct telephone reservation for their planned travel. The core of publicizing dial-a-ride service is to raise awareness to care about the vulnerable people and treat them equally.

**Conclusion**

Overall, establishment of dial-a-ride is a new thing transportation professionals of Beijing have to try. With great improvement in living standard in the civilized society by observing equity, provision of dial-a-ride system can’t be treated as blessing for disable people, but a necessity for this group of people to travel as freely as general public. It should be noted that the objective of establishing a dial-a-ride system for vulnerable groups is to make vulnerable groups enjoy the same transportation service as other commuters. It is believed that dial-a-ride will become a part of our urban transportation systems and function as a demand-response system for fulfilling the travel desire of vulnerable group. It should be fully considered that the vulnerable
groups have the absolute right to enjoy the achievement brought by the social progress. It is important to make the vulnerable people realize that they are not an exclusion but a member of the general public. It should be the ultimate goal for all levels of government to build up a society with equity and humanity.

References


