

## SIMULTANEOUS DEVELOPMENT OF AN INTEGRATED MASS TRANSPORTATION PLANNING SYSTEM

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### **Abstract**

Integrated Mass Transit Planning is a fairly new field, and integrated transportation planning is a fairly new idea. Its main goal is to come up with policies, programmes, and projects that can help reach a set of transportation goals at a low total cost to society. People from all over the world are being asked to help come up with ideas and judge them. Also, the level of uncertainty that comes with making predictions for the future is looked at, and the system's effectiveness is regularly checked. These are the parts that go into making this plan work. The principles and practises of integrated transportation planning are talked about. The Puget Sound Regional Council asked for this to be used by urban planning groups. As part of our discussion of strategic planning, we explain about the differences and similarities between the ways transportation is planned now, as well as the analytical problems that arise when integrated transportation planning is used.

**Keywords** Mass Transit Planning , Integrated , transportation is moving

### **Introduction**

More and more policymakers and academics are starting to support the idea of planning for all modes of transportation at once. This idea is still used in almost every masterplan for urban and transportation development in the world [1,2]. But the actual implementation has been put off by a long time. The shift from thinking about the supply side to thinking about the demand side is a very important part of transportation planning as a whole. Instead of clinging to an old idea of transportation planning as a way to provide the infrastructure needed to keep and/or improve traffic flow, one needs to change their point of view to focus on people and their specific needs. The other option is to stick to the idea that transportation planning is a way to make sure that the infrastructure needed to keep or improve transportation is in place. The many people involved in politics, the economy, planning, and civil society must look at the benefits of a strategy that is based on what people want. So, everyone agrees that there is a difference between the idea and how things are in real life. The German Ministry of the Environment paid for this research project on e-mobility, which will be the focus of the case study in this paper. During the project, the way the research was done changed in a big way. We wanted to find out what kind of charging stations would be needed to get people who park on the street in the city to switch to electric cars in the future. During the research process, however, the research perspective changed in a major way. The "predict and provide" method

was used by transportation planners when they wanted to plan for the supply side of transportation. In other words, this plan was based on the idea that just switching to electric cars would be helpful. The Ministry of Transportation did not do a thorough study of the specific transportation needs of its citizens because it thought there would be a demand for private electric cars. So, the goal of the study was to find the best way to set up the charging infrastructure. Based on what we learned from our research, we think that the instruction should be ignored in favour of a demand-driven approach in which we look into the needs of the participants that would have been missed otherwise. Instead of collecting data to back up the suggested changes, our strategy led to clear empirical results that showed people would rather get rid of all private cars than switch to e-mobility vehicles. We couldn't back up the planning interventions we suggested because our method didn't collect the right data. Because of this change in how research was done, a bottom-up planning method was made that was much better for the environment and society than the old one.

### **Integrated Mass Transit Planning**

Even though integrated transportation planning has been around since the 1970s and is now widely accepted by both researchers and policymakers, it has not yet been put into practise [4]. Even though it has been around since the 1970s, integrated transportation planning is still not used very often. Because we don't know enough about it, it's hard to make a case for integrated transportation planning. Climate change and the shift from a fossil fuel-based to a post-fossil fuel mobility culture are making people want more integrated approaches to policy and practise in general, and integrated transport planning as a "inter-discipline" in particular [5]. The reason for this is that people are switching from fossil fuels to non-fossil fuels as a way to get around. Since integrated transportation planning is better than traditional transportation planning in a number of ways, we'll start by showing the main differences between the two. Then we'll show you how integrated planning for transportation can make your life better. Instead of the traditional "predict and give" method, goal-oriented planning is used in integrated transportation planning. Traditionally, transportation planners have focused on the amount of traffic, responding to the ever-growing amount of traffic by building the infrastructure needed to support traffic speed and flow. On the other hand, the integrated approach aims for sustainable growth in transportation by meeting the needs of people instead of focusing on traffic. Planning for transportation is moving from being based on supply to being based on demand. This is often called "planning for transportation based on people." This shift in thinking requires not only a strong focus on stakeholder participation and empowerment, accessibility, and ecomobility, but also strategic planning [7,8]. Putting people at the centre of transportation design has made things more difficult. Because, in addition to the technical aspects, things like quality of life, sustainability, and social justice, as well as the practicality from a financial point of view, are now important. An intermodal approach to transportation is no longer a goal in and of itself. Instead, it is tied to the larger goal of making transportation that is made with people in mind. Integrated transportation planning must be interdisciplinary in order to meet the needs of many different areas, such as society, technology, the economy, the environment, and politics. It is important to know about the society in which planning takes

place and to know what is technically possible, economically beneficial, and good for the environment. Planning should be done with a clear understanding of how politics affect it. Because of all of this, it has been hard to start using integrated transportation planning. Because of this, many planners still choose to keep things simple because they don't want to get too busy [9]. [10, 11] Integrated transportation planning is based on three main things: Figure 1 shows that infrastructure management includes a wide range of structural supply measures (such as building roads) and limits (e.g., removal of road infrastructure). Traffic management is the second pole. It includes a wide range of supply methods (like "green wave" for public transportation) and restrictions (e.g., city toll). Lastly, mobility management includes a wide range of supply-related actions (like free public transit tickets) and a wide range of restrictions (e.g., commercial control over parking space). The third pole is different from the first two because it shows how transportation planning can be done with the community in mind.

#### Related Work

Schwedes, O.; et al[3] chose to go against the order and completely change their point of view by taking a demand-based approach and asking the people about their needs, which would have gone unnoticed and unheard of otherwise. Our method led to a much more sustainable, bottom-up planning strategy that was in line with the social and environmental benefits of an integrated transport planning approach. It also showed what the real mobility needs of people living in inner-city areas of Berlin were. Instead of making data to support proposed planning interventions, our method led to a much more sustainable, bottom-up planning strategy.

Paul Waddell[4] Researchers are working more and more on making models that take land use and travel into account. Public agencies want to get better at making policy decisions about transportation, land use, and the environment. In academic research, theory and method are very important. If models aren't well explained, public agencies could hurt a project. We use the knowledge of other planning groups as a starting point for UrbanSim. A system from another city can make things hard in Honolulu, Houston, Phoenix, San Francisco, or Seattle. As a result of our research, we have some ideas for how to improve the model system in the future. Integrated land use and transportation modelling research is being used more and more by government agencies to help them deal with tough policy problems. Moving models from an academic research setting, where theoretical validity and methodological progress are most important, to a public agency setting, where dependability, ease of use, and employees' ability to explain what the models do and why are hindered, may be a project. The planning groups that have adopted UrbanSim and connected it to their transportation model systems have been a great help to us. When a system from another city is used in Honolulu or Seattle, it can cause trouble. As a result of our research, we have some ideas for how to improve the model system in the future.

Toan, T.D et al[5] This study looks at Singapore as a case study to find out how integrated transportation planning could help cities grow in a way that is good for the environment. It is looked into how Singapore's ways of planning to physically and institutionally connect different kinds of transportation could be used to connect transportation and land use. This

essay looks at how Singapore plans its cities and gives Hanoi and Ho Chi Minh City some ideas for how to improve their integrated transportation planning.

Werner Heyns et al[6] In this chapter, steps are taken and assumptions are made to explain the process in more depth. It also shows how transportation modelling is used in the real world to show how important it is in the relationship between planning for space development and transportation planning and provision.

T. Mátrai, et al[7] This article aims to demonstrate how Budapest's transportation planning differs from that of other cities. Three years were spent by BKK and its subcontractors developing an integrated multimodal transport model (MTM). This concept is founded on a large-scale data collection procedure that aids in decision-making. With the aid of this new technology, more certain and fact-based decisions can be made. This could enhance the quality of life in Budapest over time.

Karami, Zahra et al[8] This article's primary objective is to compare and contrast the transportation planning of Budapest, Hungary, with that of other cities. BKK and its subcontractors worked on the development of an integrated multimodal transport model over a period of three years (MTM). The foundation of this idea is a method for gathering information on a massive scale that may be used to help make decisions. Decisions can be reached that are more certain and are founded on facts with the help of this new technology. This has the potential to improve the standard of living in Budapest over time. Proposed methodology

A group of seven academics with backgrounds in transportation planning, sociology, political science, and urban planning worked together to collect data and figure out what it meant. In the end, this diversity helped bring together a lot of different points of view, which was reflected in the exploratory and qualitative study methods. Also, it was important to use the methods of adequacy, openness, communication, and triangulation to meet the criteria for qualitative research, such as intersubjectivity, validity, and reliability [13]. To achieve the goal of openness, it would have been counterproductive to have a group of researchers that was less diverse (for example, only made up of traffic planners) and had more similar and pre-made perspectives and methods. On the other hand, the goals of communicative validation and triangulation depend a lot on having a more diverse group of researchers, each with their own set of skills, opinions, and points of view. In order to help with the process of making the design for the qualitative analysis, the first step was to do research on what had already been written. The research was mostly about how people use cars, how they move around, how they park, and how they use different kinds of transportation. The data sets "System of Representative Traffic Behavior Surveys" [12] and "Mobilitat in Germany" [14] were looked at to figure out how people move around in Germany now. After that, the research team did sixty guided interviews with local people to learn more about the community's mobility needs and figure out how to meet them. The interview instructions included questions about the interviewees' views, motivations, and how they use different types of transportation, as well as questions about their daily mobility habits and whether or not they thought it would be possible for them to change how they move around. 30 of the 60 interviews were done with people from the

official sample group, which was made up of people who owned cars and parked them on public streets. The first thing we wanted to do was find out what kinds of mobility needs people have on a daily basis and how much these needs are related to having a private car. The last 30 interviews were done with a comparison group of people who already used more than one mode of transportation for their trips but did not own a car at the time of the study. These people are called "multimodals." Their choices about how they moved around gave us useful information that was used to create measures and a framework to get people to choose different ways to get around. But the empirical findings that follow will only apply to the first group of on-street parkers. The second group of multimodals will only be used to explain other ways to promote lifestyles that don't involve cars. Recent transportation policies have focused more and more on reducing the number of people who drive their own cars in cities, while also encouraging people to walk, bike, or take public transportation as a way to promote sustainable mobility in the future. Even traditional car owners already show signs of multimodal behaviour and have used a variety of ways to get around. Our findings show that multimodal mobility is already the norm in urban areas with a lot of people. This shows that there are other ways to get around that don't involve a car. Politicians and planners should use this information to come up with plans that help car-dependent households get around without using a private car or even a private electric vehicle. A German survey on mobility found that the use of more than one mode of transportation is also on the rise. This means that more and more people use at least two different ways to get around in a single week. Most of the time, this includes driving a car, riding a bike, and taking public transportation. So, it's important to look at how people move around with the different modes of transportation they already use and come up with alternatives that fit the needs of the customers [25]. To move toward multimodal mobility, both push and pull measures are needed. These are steps that make owning a car less appealing for people who live in cities by encouraging the development of other ways to get around and making it harder for people to get around. These rules, called "travel demand management" [26], can either offer incentives (called "pull measures") or make it hard for people to travel (called "restrictive measures") (push measures). Several studies have shown that a single measure is not nearly as effective as a combination of effective push and pull measures [27,28]. But the best results come from a combination of the two types of measures. So, if we want people to move around without cars in the future, we need to make driving and owning cars less appealing. At the same time, it's important to support both active and public ways to get around. For this change to happen, it will take a lot of political work over a long period of time and an approach that is both goal- and people-focused. This will make push-measures work and be acceptable to all kinds of users. Another interesting thing about people who park their cars on the street is how different they are in how they use their cars and how they feel about them. People who took part in our study and parked their cars on the street can be divided into two groups: those who want to keep their own car and those who are willing to use their car less and find other ways to get around. As has already been said, there are four separate groups: People who are willing to live without a car but can't because of their jobs, families, or other personal situations are called "car prisoners." Keepers are people who are willing to live

without a car as long as there are more ways to get to the city's edges and move goods within the city. This last point was the main reason why car sharing wasn't a good idea (along with the absence of car seats for children and leasing costs). Optional users are people who don't want to live without a car, but would use it less if there were improvements in other ways to get around. These people are in the category of "optional users." Prioritizers are people who drive their own cars for all of their transportation needs, no matter if other options are available or not. No matter what, they are not willing to give up their own car or cut down on how much time they spend driving it. Because of this, it is highly recommended that transportation policy measures and transportation planning measures be made with specific groups in mind. Based on the results of this analysis, we can figure out what users need and make suggestions, such as promoting both institutionalised and private car sharing, putting in place smart parking management, making it more expensive to own a car (through taxes and insurance, for example), and improving public transportation so that it becomes a form of "public mobility" that allows people to use all kinds of transportation modes instead [2]. Also, improving the infrastructure for bikes would be a pull-measure that is both cheap and effective. This would help improve the local culture of biking.

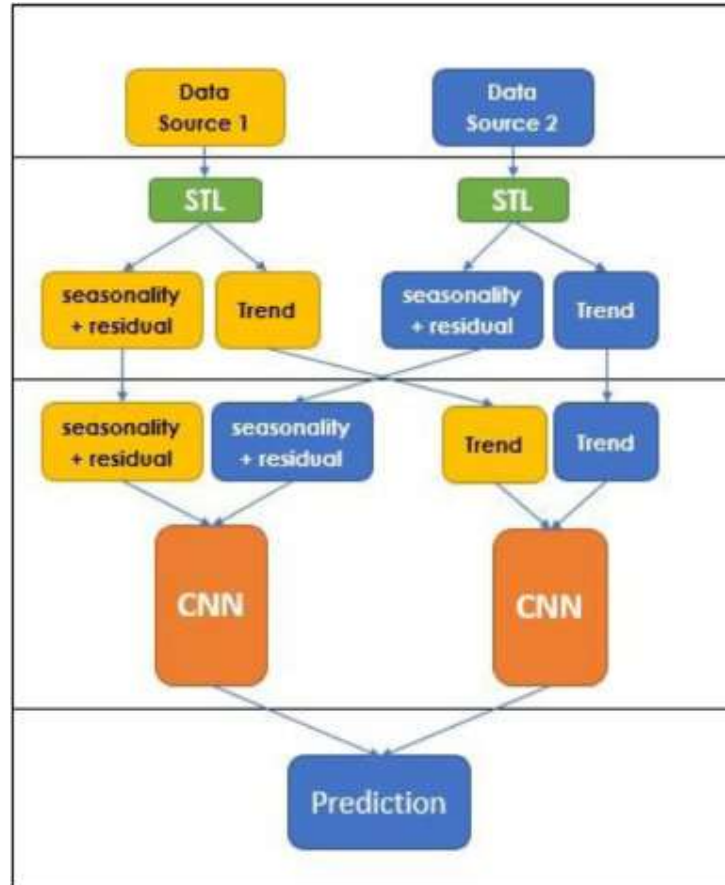
### **Mass Transport System**

Mass Transport System is a bus system that is the main way people get around the city. In terms of the National Urban Transport Policy, the main goal of a Traffic and Transport Plan is to make a network of public transportation that is efficient, cost-effective, and as large as possible so that as many people as possible can get around in a way that is comfortable, easy, and cheap. So, for the city to become a world-class tourist and IT city and to keep up with the growth that is expected in the future, different plans must be put in place to improve public transportation in the city.

### **Components of the Traffic and Transportation Plan**

The results of the demand assignment for the base year and the horizon year on the integrated road network have made it clear that the city's road network is not only limited in capacity, but also has no clear order because there are missing links and not enough basic road infrastructure. This makes it hard to make the most of the facilities that are already there. The obvious results are sloppy and dangerous movement, which leads to traffic jams and damage to the environment. So, if there are to be investments in the transportation sector, they need to be prioritised in a way that gets around the problems caused by the lack of road improvements. This is needed to make sure that travellers' best interests are protected as a whole. Planners have to do everything they can to make sure that better criteria are met, both in terms of the quality of the environment and the way available space is used. The planned road development programme, which is described in the next few paragraphs, has been put together based on the priorities that were listed above. In the chapter before this one, we looked at the expected future travel demand along the different routes. So that the public transportation system can handle the expected amount of traffic until the year 2028, a plan has been made that shows where different types of public transportation will be along different routes. A road system that can handle the right amount of traffic should be able to meet the needs of the regular bus system as

well as those of other modes of transportation, such as two-wheelers, cars, bicycles, trucks, pedestrians, and so on. The planned Traffic and Transportation plan for Mysore includes the following types of proposals. They are meant to meet the needs of expected travel demand until the year 2028.



## Conclusion

For a society to move past fossil fuels, the transportation sector must change. It is being brought back to life to meet the needs of society and meet the goals of transportation policy by combining infrastructure, transportation, and mobility management. People's travel habits need to change for sustainable transportation development to happen, so it's important to focus on people. Transportation planners who have degrees in engineering but not in social science or qualitative research may find it hard to understand this human perspective. Integrated transportation planning looks at how society, technology, economics, ecology, and politics all affect each other. This is why most people agree with the idea but don't actually do it. An interdisciplinary approach is always taken when people from different fields need to work together. We need to explain why the first investment in integrated transportation planning is a good idea. When asked about e-mobility, one of our answers was based on technology. As part of a study of German law, on-street parking fees were to be put in place in densely populated city centres. Instead of assuming the presence and use of private e-cars, we changed

the study question to focus on goal-oriented integrated transportation planning and asked people about their mobility needs. The Ministry's original plan to set up a public charging infrastructure for private electric cars was very different from what we suggested. This is because most people in densely populated inner-city areas don't drive at all during the week. It was a one-year pilot project that would be paid for again afterward. We didn't meet the requirements of the ministry, so the follow-up money was taken away. As shown here, the relationship between science and politics is complicated, and problems can arise, especially when societies go through big changes. This brings up moral and research questions that we won't talk about here [31]. Researchers have to decide whether to take money or stay true to their professional values. In this case, you can see another problem with planning for all modes of transportation together. Another problem is that politicians and academics have worked together for a long time, which can be hard to change. Politicians, lawmakers, and scholars still put a lot of weight on technological solutions. Because transportation research is often influenced by politics, policymakers usually look for technical solutions, while transport research mostly provides technical solutions (thus bestowing an air of research science on politics). No one on either side is ready for new problems that will require them to change how they move. When it comes to making plans and policies for transportation, both sides are problems. Transportation policy and planning need the shift in thinking that Thomas Kuhn pushed for [32]. Even though this may change political expectations, academics must question why people think this strategy will work. Changing transportation planning and policy from focusing on supply to focusing on demand is a tough problem, as our example shows. Traditional planners don't like the paradigm shift because it involves a conflicting process and a normative point of view. We think that for society to move forward, it's important to do both political debate and academic research. We are helping to settle political disagreements about the best kind of transportation policy by showing how integrated transport planning and policy can help support the development of sustainable transportation.

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