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Computer-Aided Design AND APPLICATIONS

Identifying Optimal Rest Spaces for Food Takeaway Workers using Digital Marketing Insights Based on ArcGIS– A Case Study in Xujiahui Street, Shanghai

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Abstract. As a result of the changes in labor relations in the internet economy, a new type of online labor relationship has emerged. The change in labor relations leads to the incomplete distribution of labor, which makes the takeaway workers the main labor object due to the need for a complete workspace. Therefore, this paper addresses the issue of open space for takeaway workers. Moreover, we propose an ArcGIS-based approach to its study. We used network analysis to find the areas where the most takeaway workers passed through. And we set up the shortest routes to simulate the working conditions of takeaway workers. At the same time, we chose a good resting space for takeaway workers to rest based on their working conditions and needs. From the perspective of takeaway workers, it helps to relieve their work pressure and improve the comfort of their working environment. From the standpoint of urban development, it helps to increase the takeaway workers' sense of belonging to the city where they live.

Keywords: Takeaway workers; Rest space; ArcGIS; Site selection; Digital Marketing Insights
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1 INTRODUCTION

The urban environment needs more care for takeaway workers. The takeaway industry has seen a spurt in development, and demand continues to grow. However, as an essential part of the takeaway industry -takeaway workers, we find that violated their rights. According to the data source of the Meituan Research Institute's China Takeaway Industry Development Report for 2019 and the first half of 2020, the cumulative number of takeaway workers to the end of 2017 was about 2.99 million

people participating in takeaway delivery, and the number of takeaway workers by 2019 will be about 3.987 million[24]. The popularity of COVID-19 has been going on for more than three years, and during these times, people's consumption behavior has changed considerably due to the social distance rule. People are now more inclined to shop online rather than offline. Takeaway workers usually work non-stop for at least 12 hours a day, especially during peak meal times, and they can only take breaks while waiting for their orders. In cities, takeaway workers often need workplaces or resting places and have to sleep on their electric bikes. That is a lack of humane care for takeaway riders and a need for more functional space in the city.

Takeaway workers lack a sense of belonging in their city, and public facilities can be a breakthrough point for change. Belonging is humans' psychological and behavioral tendency to seek safety, peace, and shelter [6]. There is also a sense of belonging in the urban space, where people who work and live there can find spiritual solace. The satisfaction of people's physical and psychological needs and their vision of their development are all placed in the urban environment in which they live. The emerging internet employment mechanism has ushered in many internet workers. Delivery workers are a large category, separated from the urban space as an independent group, with no room for rest and inadequate equipment. On the one hand, delivery workers are highly mobile in providing people with takeaway delivery services. On the other hand, due to the time machine at the end of the internet platform, there are traffic safety violations such as running red lights and cycling through pedestrian traffic during the delivery process. Cities are not static. The city is a continuously changing organism, renewed and optimized as political, economic, and cultural elements develop. Urban space can be defined from different perspectives and is generally divided into areas for production, transportation, environment, housing, and public facilities according to the functional structure of the city[6]. Therefore, the open space for takeaway riders is an urgent issue in urban spatial planning.Digital marketing efforts can involve partnering with delivery platforms to raise awareness and implement changes. By leveraging the extensive reach and user base of these platforms, information about the need for open spaces for takeaway workers can be communicated directly to the delivery community. Delivery platforms can also be encouraged to incorporate features or incentives that promote the well-being and safety of their workers, including the provision of designated rest areas or improved equipment.

However, most of the research on takeaway delivery processes has focused on technical aspects such as takeaway box design [27],[13],[23], route planning [2],[5], and delivery algorithms[17],[30]. Researchers have focused on optimizing the user experience and making the delivery process more efficient, but this has neglected the needs of the delivery riders, who are an integral part of the delivery process. Therefore, this research focuses on the possibility of resting spaces for takeaway riders and how to choose suitable locations for them to sleep. In addition, we explore the siting of open spaces for delivery riders to explore the inclusiveness of large urban areas and the extension of urban functions.

2 LITERATURE REVIEW - JOB ATTRIBUTES OF TAKEAWAY RIDERS

2.1 Brief Introduction of China's Takeaway Industry

The Internet O2O platform economy is a broad concept, sometimes considered to be a "sharing economy" or "gig economy"[8]. China's internet platform economy began around 2010, and the takeaway economy was an essential part of the internet platform economy, and a relatively complete system emerged at this time. In the platform economy, internet platforms can transcend the constraints of stable time and space to promptly match labor supply and demand, creating a digitalization of the worker labor process [24]. The dispatching system of the takeaway economy has changed the takeaway model from manual dispatching to pc-based dispatching and now to the cloud-based dispatching model [17]. When the dispatch system was first formed, the platform

company employed the staff delivering the meals. At that point, the labor relationship was still the traditional employment model - fixed hours, fixed premises, and a job description [7]. However, with the introduction of information technology such as cloud computing and big data, the takeaway industry has adopted real-time dispatch systems, artificial intelligence-driven takeaway assistants, and algorithm-based performance management systems[14]. Platforms use that to deliver takeaways and manage performance management systems[14]. In this takeaway process, the platform is mainly involved in integrating data to provide order information and formulating the amount of each takeaway order based on an algorithm, with no clear regulations on the rider's remuneration and some ambiguity [7]. Takeaway workers are disadvantaged compared to platforms that hold data and information.

2.2 Employment Patterns of Takeaway Workers

While the platform side continues to improve the dispatching efficiency of the system, the way takeaway workers transport their meals is also beginning to change. The importance of time has also become more prominent. In the days of manual dispatching, takeaway riders only had to keep an eye on the dispatcher's phone and were understood despite any missed or untimely deliveries. However, with system upgrades on the platform side and users' concerns about takeaway efficiency, takeaway riders are passively improving the efficiency of their deliveries. The platform side has more precise control of time. Order allocation, time calculation, route estimation, and takeaway detection are all controlled by algorithms on the platform side. Takeaway riders under the control of the algorithms are forced to shorten delivery time continuously[3]. Time and space have become essential factors for takeaway workers to reduce takeaway time. In addition, the platform, which has a large amount of data, selects takeaway riders and matches them with orders based on their positive user feedback and takeaway efficiency. The more popular riders are matched with more orders that are closer together. In order to improve the takeaway efficiency of takeaway riders, the platform adopts gamified management to improve production efficiency [17],[2],[22]. At the same time, the platform incentivizes takeaway riders by paying them for their work [17],[9]. Takeaway workers take the initiative to improve takeaway efficiency to complete more orders to receive financial rewards. On the one hand, takeaway riders are provided with a geographically planned path of "District - Business District - Station -Group" by the platform system, which gradually covers the urban takeaway territory from large to small to shorten their time. On the other hand, takeaway riders shorten their time by traveling against traffic, speeding, jumping red lights, violating traffic control, and changing lanes illegally [17],[8],[9].

2.3 Platform Algorithms and Route Planning

The optimal path model and target algorithm of the takeout takeaway platform pay attention to platform profit and user satisfaction. In contrast, these two targets consider the issues of time and efficiency. For the path planning problem of takeaway platforms, most of the literature considers the takeaway path as a unique vehicle path problem with a time window that also considers pick-up and takeaway or a dynamic vehicle path optimization problem [11],[18]. For example, Haiyan Yu addresses the O2O fresh food takeaway path problem and proposes an O2O fresh food takeaway instant delivery path optimization model with hard time windows to minimize the delivery distance[10]. Chenghao Zhou considered dynamic takeaway demand, load capacity, and time window as constraints and regarded the business district as a distribution center. The number of couriers and courier travel time as minimization objectives, and proposed a business district-centered O2O dynamic takeaway path optimization model and algorithm[4]. According to the current situation of the O2O takeout platform, Zhang Liya proposed to establish a route model of taking takeaway vehicles with consideration of customer priority, time window, dynamic and multi-depot, and multi-objective from two perspectives of customer satisfaction and takeaway cost[19]. Moreover, she designed an improved iterative local search algorithm to solve the model[19]. Aiming

at a large number of orders in peak hours, JinZhihong proposed to take maximum transportation efficiency as the goal[29]. He comprehensively considers the actual constraints of takeout takeaway, constructs the mixed integer programming model of rider takeaway route optimization, and develops an improved ant colony algorithm to solve the example [28].

3 RESEARCH METHODOLOGY

Time and efficiency are essential for both platforms and takeaway workers in takeaway delivery. However, excessive focus on time and efficiency can overlook the disruptions arising from the takeaway. The pressure to compress time creates traffic hazards for takeaway riders and causes physical injuries. This paper focuses on selecting suitable locations for takeaway workers to rest without compromising time and takeaway efficiency.

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3.1 Site Selection Methods Based on ArcGIS Spatial Analysis

The spatial analysis method based on ArcGIS can carry out specific analyses based on real places, which is conducive to optimizing the takeaway path of takeaway riders and facilitating the planning of resting places for takeaway riders. A geographic Information System (GIS Geographical Information System) is a computer-based technology based on the collection, storage, management, computing, analysis, display, and description of a geographic information system [1]. Pi Jun studied the problem of optimizing the layout of air emergency rescue Locations [15]. He used the hierarchical analysis method to construct an analytical model of the influencing factors[15]. He used ArcGIS software to conduct spatial analysis of the vectorizable indexes of the influencing factors to select rescue waiting for sites with higher weights by minimizing the sum of distances [15]. Zhang Hao used ArcGIS to realize the customized system interface, spatial data management, shortest path analysis, buffer zone analysis, and Voronoi diagram analysis required for shelter site selection[12]. Liu Sijun et al. [21] used GIS multi-criteria technology to analyze the method of siting public facilities under the combined influence of the urban natural environment and human elements based on the spatial dimension. They made an example application with the siting of urban waste buildings[21]. Wang Ke[16] analyzed the demand for information management platforms in the logistics industry and adopted the center of gravity method and the optimized center of gravity algorithm to determine the optimal site selection for different environments for the single distribution center location problem. At the same time, he combined GIS technology to establish a logistics information management platform. ArcGIS has a wide range of applications, from siting public facilities to large fire stations, regardless of the spatial size of the chosen object. The spatial analysis function of ArcGIS can be used to select a site using distance as a constraint and shortest path analysis to obtain the most time-efficient and effective open space location.

3.2 Comparison of Site Selection Methods

Siting problems are complex and variable, and different research methods emerge depending on the different influencing factors in the actual situation. In contrast to the siting methods based on the spatial analysis of Aecgis, other siting methods have too many influencing factors, and it is, therefore, difficult to determine the exact influencing factors of other siting methods. From the perspective of improving the time robustness of rescue and effectively avoiding the long-term risk of uncertainty fluctuations on facility siting, Tang Zhaoping proposed the method of determining the

interval weights of network nodes, and also considered the joint effect of node weights, edge weights and uncertainty of path proper intervals to construct a weighted network of nodes for siting railway emergency facilities[27]; Li Yanbo, from the perspective of reducing costs and maximizing the satisfaction of charging demand For the problem of siting of switching stations on highways, a genetic algorithm is proposed to solve the siting model to obtain the initial solution for siting, and finally the final optimal siting point is obtained by screening the initial solution using statisticalanalysis[25]; Ma Zujun establishes a mixed integer linear programming model from the perspective of reducing losses in the logistics process, and designs a genetic algorithm for A genetic algorithm was designed to solve the site selection method based on the characteristics of the model [31]. Other site selection methods are more complex as they are easily constrained by the actual situation and need specific influencing factors. More importantly, conducting large-scale and in-depth data studies during the Shanghai epidemic is difficult.

3.3 Site Selection Methods for This Paper

In the spring of 2022, the epidemic situation in Shanghai was difficult, and people were restricted to their homes, significantly impacting academic research and making it more difficult to obtain data than in previous years. After comparing various aspects of this research project, it was concluded that the more straightforward Euclidean distance method was more reasonable for the siting of rest facilities for takeaway riders. With the aid of ArcGIS-based spatial analysis, the results of the Euclidean distance method are close to the time and efficiency calculations that concern the intelligent algorithm on the platform side. With the location of both the mall and community demand points in mind, the Euclidean distance method uses the distance between the two as the primary influencing indicator for site selection, which can significantly save time for takeaway workers affected by the time mechanism. Therefore, this paper uses the Euclidean distance method as a preliminary site selection method for locating open spaces for takeaway riders.

3.3.1 Method 1: GIS network analysis

The network analysis method uses the road density of each grid to approximate the resistance to transport costs, taking into account factors such as population distribution, public green space landscape service capacity, and transport costs in the accessibility calculation[28]. It is a spatial analysis method that uses the topological relationship of network elements to investigate the spatial attributes of network elements to optimize the network structure and resource allocation, Etc. Its theoretical basis is graph theory and operations research[28]. In this paper, the shortest path analysis function of network analysis is used to obtain the most frequently passed road section between the community and the shopping mall and simulate the actual road network analysis of the takeaway riders using the platform to deliver food to users.

3.3.2 Method 2: GIS raster density analysis

The raster data structure, also known as grid structure, is a data organization way to express the distribution of spatial ground objects or phenomena in the form of a two-dimensional matrix, namely, a pixel array. Each pixel has a given attribute value representing geographic entities or phenomena. This paper uses raster density analysis to discover the distribution characteristics of communities and shopping malls in the Xujiahui street area in order to facilitate further analysis and research on the distribution characteristics of communities and shopping malls in the Xujiahui street area and to facilitate the understanding of field information in the study area.

The location selection method of the Euclidean distance method with a single index has certain defects. Therefore, in this paper, combined with the spatial analysis function of ArcGIS, raster density analysis is used to make location decisions further. Finally, combined with the needs of takeout riders, the location range of takeout riders' rest space is determined.

3.4 Research Ideas

The research methods used in this paper are the spatial analysis function of ArcGIS, the network analysis method, and raster density analysis. In this paper, we use the spatial analysis function of ArcGIS to collect the most common paths taken by takeaway riders from communities to shopping malls and then carry out raster density analysis to discover the characteristics of clusters in communities and shopping malls. Finally, the spatial extent of rest facilities for takeaway riders was determined based on their work-related habitual behavior, such as searching for toilets, charging places, Etc. Figure 2 shows the research idea of this paper.

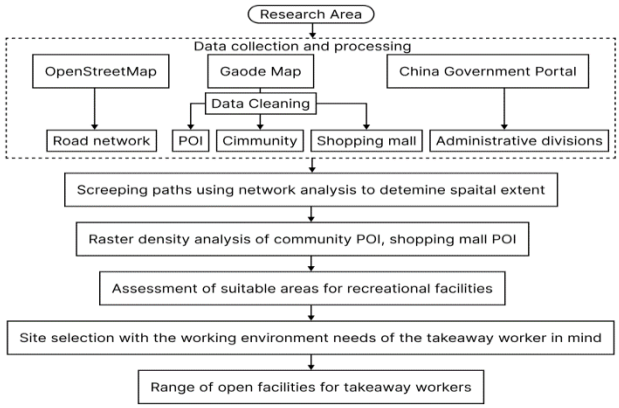

Figure 1: Site Selection Process for Takeaway Rider Open Space.

4 CASE STUDY

4.1 Overview of the Site

Xujiahui Street is located in Xuhui District, Shanghai (31°19’N, 121°44’E), in the central and western part of Xuhui District, with a subtropical monsoon climate. The Xujiahui shopping area is located on Xujiahui street. The Xujiahui shopping area is the largest commercial area in Shanghai, where the retail and restaurant commerce scale is enormous. From the perspective of planning and designing a rational layout of future retail outlets in a region, a central area with a central ground at its center is called a "shopping district". Since 1990, the Xujiahui District has been building a large-scale shopping district with the Xujiahui area as a prototype. Due to the large-scale and rapid development of the Xujiahui district, it has become a typical representative of large shopping centers in China.

There are three reasons why Xujiahui street was chosen as the study area for this paper: firstly, Xujiahui street has few extreme weather conditions affecting takeaway delivery. Xujiahui street has a mild climate throughout the year, with four distinct seasons, humid air, and more sunshine. This climate is also suitable for food takeaway riders to deliver food year-round. Secondly, the Xujiahui business district has a high level of activity in terms of takeaway orders due to its prime location and ability to gather consumers, which is conducive to the long-term development of the takeaway industry, and takeaway riders tend to gather in this area. Thirdly, relying on the commercial

prosperity of the Xujiahui business district and the geographical location of the shopping center, the demand for takeaway is more active in the surrounding areas, with the majority of white-collar workers as the leading consumer group having a relatively high demand for takeaway. Xujiahui street is a typical hotbed for the development of the takeaway industry, so this paper chooses Xujiahui street as the study area.

4.2 Spatial Distribution

After the statistics in Figure 1, we found that in Shanghai Xujiahui street, there are 151 communities and 21 shopping malls. The distribution of poi data points in Figure 1 shows that most of the cell locations are in the east-west area of Xujiahui near the main road, with sparse areas to the north and south. The shopping malls are located in the most densely trafficked areas, mainly around the intersection of Cao Xi North Road and Zhao Jia Bang Road. The distribution of poi data points in Figure 1 shows that residential and commercial areas are unevenly distributed spatially, with communities and shopping malls showing clustering. The more communities there are, the fewer malls there are, and conversely, the more malls there are, the fewer communities there are.

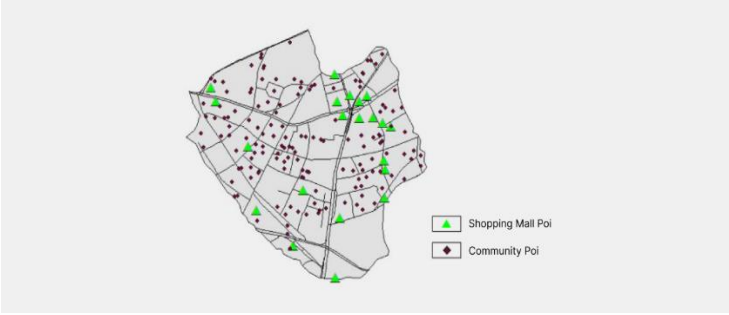

Figure 2: Overview of Xujiahui street community and shopping mall distribution.

4.3 Data and Processing

4.3.1 Data collection and processing

The data used in this study include poi location data of shopping malls and communities in the Xujiahui street area, road network data of Xujiahui streets, and administrative district data of Xujiahui streets.

- The poi location data was sourced from the online map service platform, Gaode Map (http://lbs.amap.com/), through the java programming language to call the Gaode Map API and set the range of acquired data for the study area, which was acquired in March 2022. Its POI data types are community poi data and mall poi data. The acquired POI location data contains 172 valid data after data cleaning, coordinate conversion, and collation.
- The road network data was obtained from the OpenStreetMap database.OpenStreetMap (https://www.openstreetmap.org/), based on Shanghai's geographic monitoring data, obtained the road network data after pre-processing, such as topological relationship error checking and editing, and modification.
- The Administrative Districtization data is from the Chinese government portal, Administrative Divisions of the People's Republic of China. (https://www.gov.cn/). Using the filtering function of ArcGIS, the administrative division data of Xujiahui street was obtained after filtering the administrative division data nationwide.

4.3.2 Application of ArcGIS spatial analysis

This paper applies network analysis, constrained to the shortest path, to collect the trajectory roads of the shortest path between the community and the mall, as shown in Figure 3. That is then aggregated into document data, as shown in Figure 4. Finally, the document data is aggregated and analyzed, as shown in Figure 5. By analyzing and integrating the data, the trajectory routes of the takeaway riders are modeled as closely as possible.

Figure 3: Network analysis method applied in ArcGIS software.

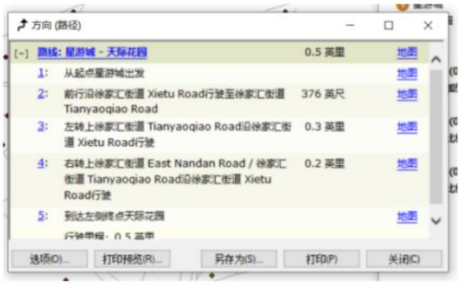

Figure 4: Document data formed by shortest path.

4.4 Results and Analysis

This paper uses the network analysis function of ArcGIS to create trajectory data (constrained to the shortest path) between the community and the mall. It obtains document data formed by 3192 trajectory data. The trajectory data was analyzed in the road for road aggregation, as shown in Figure 5. After continuous comparison and analysis, it was found that the trajectory data overlapped the most times on the main roads, which are: North Cao Xi Road, Hong Qiao Road, Zhao Jia Bang Road, Nandan Road, Tian Yao Qiao Road, Huashan Road, Cao Xi Road and Xin Keng Road.

Figure 5: Takeaway rider track aggregation analysis.

A raster density analysis of community poi and mall poi over a 200m range yields a demand distribution as shown in Figure 6. The raster map of the distribution of demand for shopping mall trips shows that the intersection of North Caoxi Road and Zhaojiabang Road is the central gathering place for shopping malls, with a density of 5 to 6. The raster map of community travel demand distribution (shown in Figure 6) reveals that the principal agglomerations of communities are concentrated in the west-central part of Xujiahui street, with a density of 14-20.

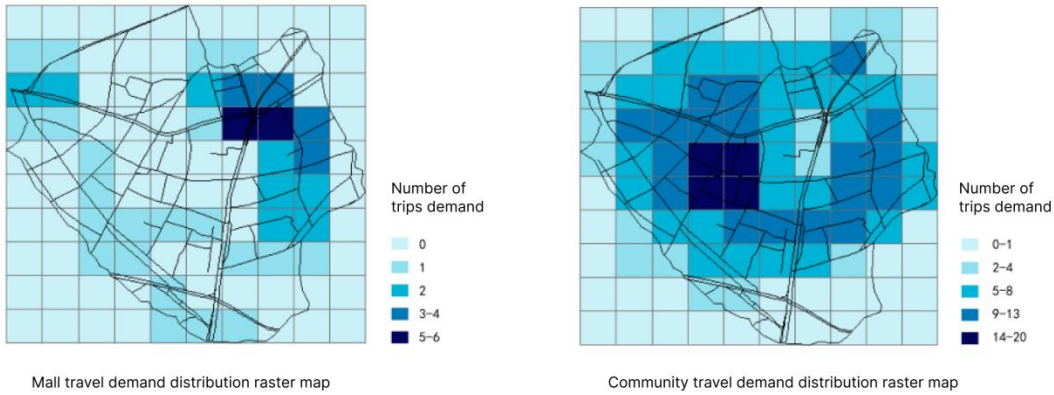

Figure 6: Raster map of travel demand distribution.

Takeaway workers deliver takeaways as follows: receive an order → pick up the takeaway from the merchant → deliver the takeaway to the user → next order. Takeaway workers give up their time to earn more commission, earning an income for their labor. The more orders they deliver, the more they are paid for their labor. Takeaway riders need to equip themselves with the equipment they need to do their job, such as mobile phones and electric bikes before they can deliver. As we can imagine, mobile phones and electric bikes are essential for takeaway, and charging them is a priority for takeaway riders. As a result, they have their own physiological needs, such as going to the toilet and parking their vehicles for rest. That is shown in the table below.

Level 1 Classification	*Equipment maintenance*	*Physiological needs*
Level 2 Classification	*Mobile phone charging*	*Going to the toilet*
	Electric vehicle charging	*Rest*
	Parking of equipment	*Eating and drinking*

Table 1: Takeaway riders' own needs.

The needs of takeaway riders can only partially be met in areas where communities congregate; instead, areas, where shopping malls congregate can maximize the needs of takeaway riders. They will spontaneously gather near shopping malls for places and resources to recharge, go to the toilet, rest, and eat, as shown in Figure 7. Therefore, a spatial analysis of where shopping malls congregate reveals that toilet locations congregate near Shanghai Gateway 66 Mall, and bicycle parking points congregate on Huashan Road. Charging facilities are widely distributed, most numerous, mainly clustered around Metro City, and green spaces exist in Xujiahui Park.

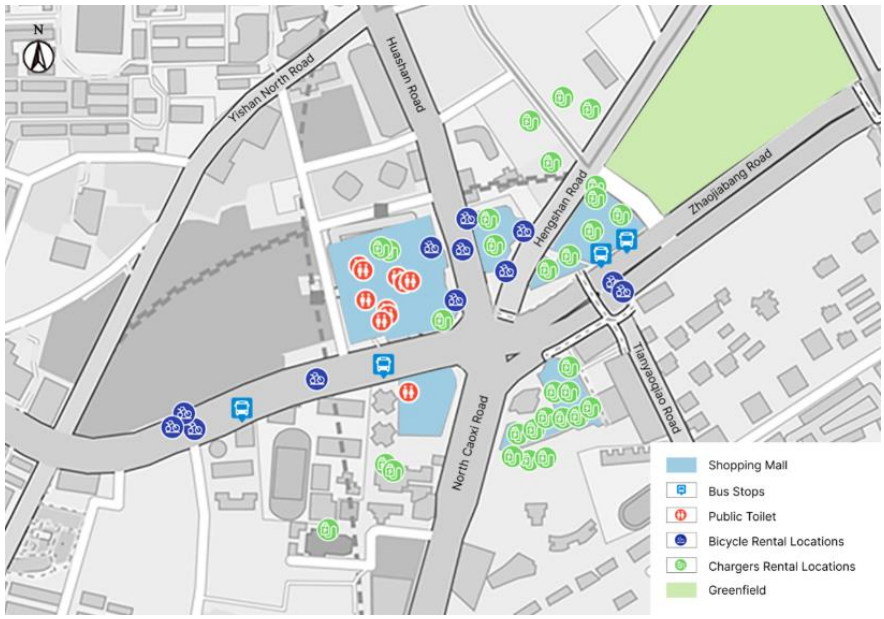

Figure 7: Analysis of demand for takeaway riders at the intersection of North Cao Xi Road And Zhao Jia Bang Road.

Takeaway rider rest facilities should be situated close to takeaway delivery hubs. Make the takeaway rider rest facilities form a proper node in the takeaway process. Rest facilities should be as close as possible to shopping malls, food courts, community entrances, Etc. Takeaway rest facilities must have easy access to transport and be laid out as close as possible to businesses and transport hubs, such as shopping malls, food streets, and nearby junctions. Two or more pick-up points should be connected so that takeaway riders can adjust their takeaway routes. Rest facilities for takeaway riders should be conveniently located. They should have a suitable range of space so that they can both deliver goods and ensure their physiological needs are met. If we choose to connect to a transport hub site is ideal, such as a bus station. Secondly, we can be on a food, commercial, or pedestrian street; the road that can not be parked should be avoided entirely.

The scope of space for resting facilities for takeaway riders should be chosen in the area where shopping malls gather, i.e., the site covered by the intersection of Cao Xi North Road and Zhao Jia Bang Road. Charging facilities are extensive and plentiful here, and the facilities inside the mall can cater to takeaway riders to use the toilets, eat and drink, park their vehicles and take a brief break. The location of rest facilities for takeaway riders should consider factors such as the conservation of public resources and the human environment to minimize disruption to urban life. Takeaway riders do not have a working space to which they belong in the urban space, are subject to the urgency of the time mechanism at the end of the network platform, and are in a state of no sense of belonging, with higher psychological and physiological stress than in other jobs. The design of resting places for takeaway riders can effectively relieve their work pressure, thus enhancing their sense of well-being and belonging to the city they work. In this paper, we take Xujiahui street as an example of the selection of resting places for takeaway riders so that we can scientifically analyze the activity status of takeaway riders in Xujiahui street. Finally, according to the nature of the takeaway rider's work, the takeaway rider's rest space site is reasonably selected to improve the efficiency and comfort of the configuration of the takeaway rider's takeaway.

5 DESIGN OF OPEN SPACE FOR TAKEAWAY RIDERS

5.1 Design Orientation

This design is based on a network analysis that reveals the most common road passed by takeaway riders, where a resting space can be set up. The raster space analysis locates the areas where the takeaway riders are most active and provides a resting space. Considering the problems of space resources and cost, open space combines open space and a bus stop to design a bus station space design that integrates the functions of rest and waiting.

5.2 Scheme Design

In terms of space layout, this design changes the layout of the bus stop by installing two seats to change the space pattern. The space has been opened to give the bus station an open layout for passengers and takeaway riders. The seating arrangement, one in front of the other, is designed to separate the passenger from the takeaway rider and avoid distracting trends during use.

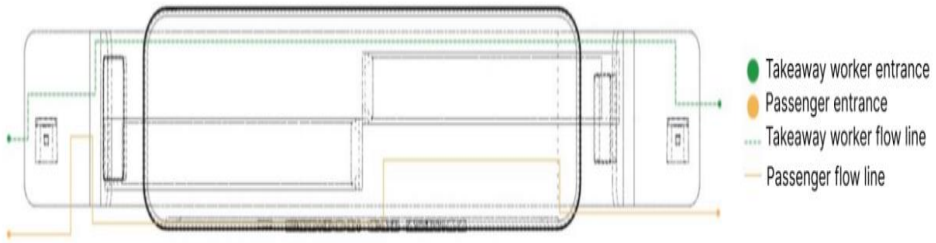

Figure 7: Movement planning.

Figure 8: Seating layout.

In terms of intelligent hardware, the bright screens built into bus stops can provide information on the movement of bus vehicles, helping people to obtain timely data on the movement of bus vehicles and plan their journeys better. The charging ports can be configured to help takeaway workers recharge their electric bikes and mobile phones for power replenishment.

In terms of design, the overall curved surface reflects the inclusiveness of the bus station, the choice of stainless steel increases the stability of the bus station, and the use of wood in the seat surface gives the bus station an affinity and original aesthetic. The colors follow the visual identity of the Shanghai bus brand, using black as the primary color and green to highlight the brand image of the bus station while using white as a secondary color for accents.

Figure 9: Display and charging post.

Figure 10: Styling of the takeaway rider's resting space.

6 CONCLUSION AND DISCUSSION

This paper focuses on the unequal relationship between the platform side and the takeaway riders and bets on the research perspective on takeaway workers. Consider the interests of the particular group of takeaway workers and choose a suitable address for their resting space to help them feel less overwhelmed by the intelligent algorithms from the platform side. That is an essential step in exploring the relationship between takeaway riders and the urban public space, exploring the hidden corners of labor relations in the O2O platform economy, and helping to address the ills arising from China's rapidly developing internet information age. However, the shortcoming is that obtaining first-hand information from takeaway riders as they move in and out of the city during the epidemic prevention and control period is challenging. As a result, this paper needs a model study from the takeaway riders themselves. It cannot provide a more comprehensive examination of the dynamic demands of delivering takeaways.

The contactless takeaway is becoming a popular trend with the normalization of the epidemic. The other side of the coin of contactless takeaway is the result of takeaway riders' efforts to race against the platform's time mechanism. Takeaway riders then become a different kind of labor object from the traditional labor relationship, lacking direct company benefits, workplace facilities, and humane care in a new high-tech age. That is a lack of humane care in the new high-tech context. Therefore, the location of rest facilities for takeaway riders is an essential step in improving the takeaway experience of takeaway riders. Improving the takeaway experience for takeaway riders will help improve the takeaway process's efficiency and enhance the user experience of using the takeaway platform. As the takeaway industry matures, the takeaway chain is becoming more and

more sophisticated, and the actors involved are becoming more diverse. From the perspective of promoting the long-term development of the takeaway industry, the underlying contradictory issue of improving the takeaway riders' takeaway experience becomes increasingly essential with the diversification of the main actors involved.

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