

# Small Transfer Point On the Example in Opole, Poland

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**Abstract.** The paper presents the conceptual design of Small Transfer Point in Opole in Poland. The location on a triangle with an area of about 70 ares along with the whole 1 Maja Str. to the junction with Wladyslaw Reymont Str. There were introduction the current situations in this part of Opole City with problems and their solutions. The problems in creating the conceptual design include: very small area to be developed, non-functional location, dense traffic, large number of travellers, difficult planning of MZK (Municipal Communication Association) lines. Upon analysing the current situation, it becomes necessary to reorganize the vehicle movement from scratch, which we dealt with in the project. The Transfer Point has been designed focusing on modifying the traffic around it, taking into account the transformation of bicycle traffic.

## 1. Introduction

In today's world, time is the most appreciated and desirable aspect of life. A number of solutions are being created in order to increase it, including transport. Trains are getting faster; buses are better adapted. The number of cars is increasing proportionally. In response to the current situation, man as a passenger increasingly chooses to travel by public transport. A positive solution is to allow a functional transfer between multiple means of transport – city buses, suburban buses, long-distance buses, train, taxis, and NextBike bicycle rental – in order to ensure that road users are comfortable with the existing conditions. There is no such place in Opole. The Transfer Point will become just that. Situated between the Main Railway Station and the PKS bus station in Opole, right in the city center. It is ideally located for passengers, tourists and locals.

The problems in creating the conceptual design include:

- very small area to be developed,
- non-functional location,
- dense traffic,
- large number of travellers,
- difficult planning of MZK (Municipal Communication Association) lines.

Upon analysing the current situation, it becomes necessary to reorganize the vehicle movement from scratch, which we dealt with in the project. The Transfer Point has been designed focusing on modifying the traffic around it, taking into account the transformation of bicycle traffic. The process of creation and implementation of the concept has not only considered changing stops and identifying new routes. Aspects such as the calculation of frequency of each bus line running in Opole and stops located near the Transfer Point were considered. In addition, the work included the ergonomics of technical



parameters of the road – turn radius in U-turns of articulated and non-articulated buses, entrance and exit slant of bays or widths of streets.

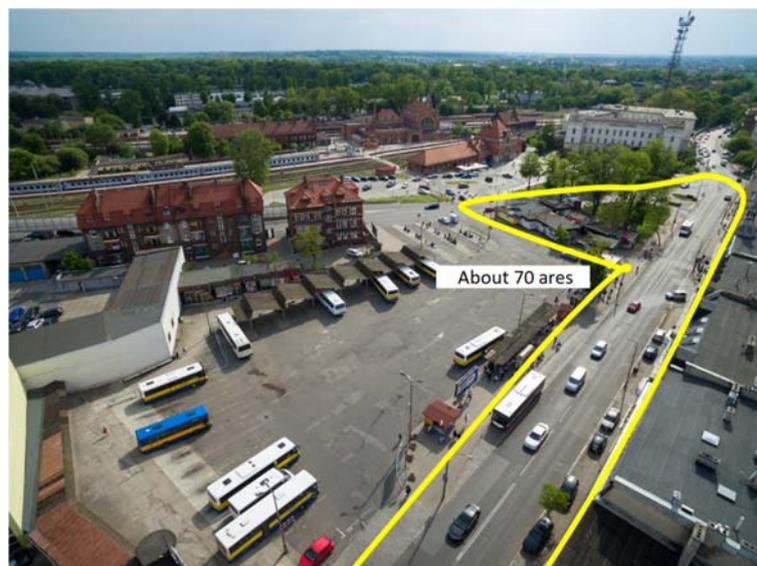
## 2. The purpose of creating the Transfer Point

The purpose of the Transfer Point is to quickly switch from one means of transport to another, not only collective but also individual. Trains, city buses, suburban buses, long distance buses are collective means of public transport, while TAXI and NextBike bicycle rental are individual ones. So the goal is to place all of these elements as close as possible to one another. It is also important to accelerate the movement of vehicles, and bus traffic is the most important for us, a priority in this concept, because we want to convince people to depart from cars and switch to municipal transport and bicycles. This is exactly where our goal is to adapt the streets around the point as well as the point itself to the safe movement of bicycles. This is supported by the NextBike bike rental station located nearby.

## 3. Location

Location is the most important place for the Transfer Point, because this is where its usefulness comes from. The location for this Transfer Point is perfect in terms of proximity to all types of collective and individual transport. Directly neighbouring are the main railway station "Opole Główne", main bus station, taxi rank, NextBike station (the bicycle rental station), and 11 lines of MZK municipal buses pass by the neighbouring 1 Maja Str. and Armi Krajowej Str. There is also a hospital, police station and the Polish Post Office in the neighbourhood. In addition, there is a regional road no. 423 which currently does not have right of way. Everything is in the very centre.

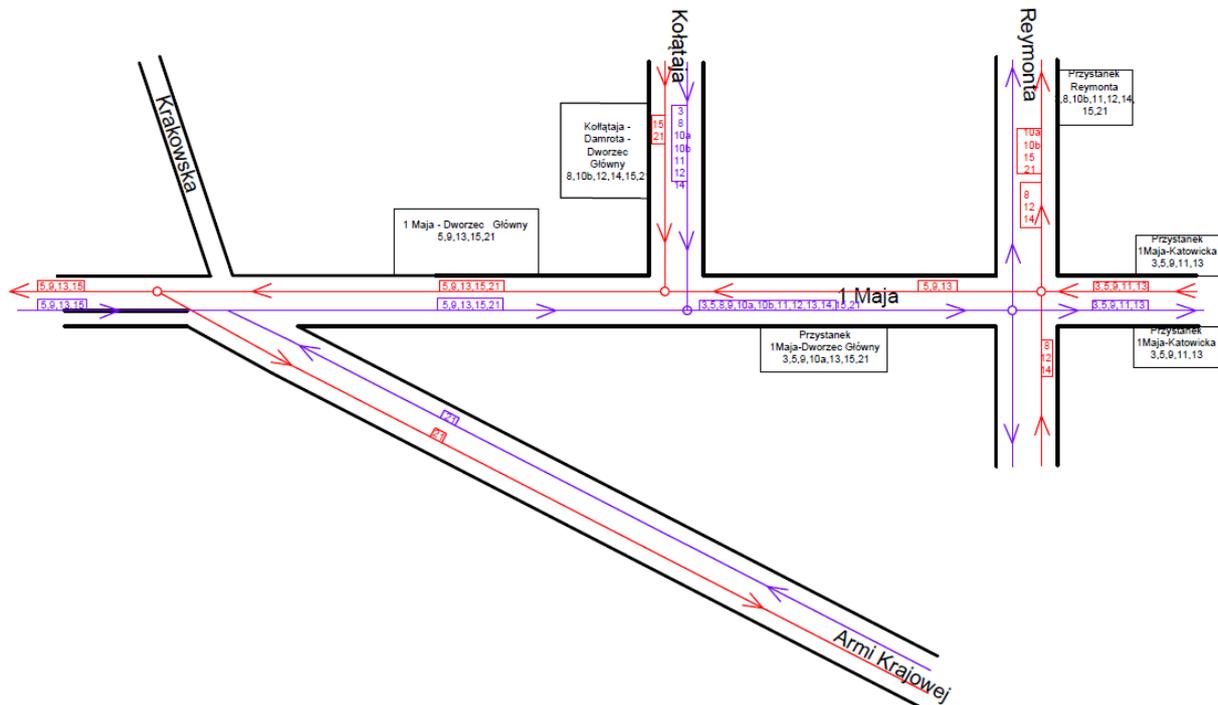
However, there are some difficulties related to the area. The shape of the area is a triangle with an area of about 70 ares along with the whole 1 Maja Str to the junction with Wladyslaw Reymont Str. (Figure 1).



**Figure 1.** Location of the Small Transfer Point

## 4. Current situation

At the moment, city buses are the most difficult issue. Bus stops are at different distances from the Transfer Point, and lines stopping at them travel to and from different directions, which results in the problem of locating these stops at the Transfer Point (Figure 2).



**Figure 2.** Current layout of city lines (MZK)

Traffic jams during rush hours that impede bus travel and slow it down, often blocking it, pose another problem currently occurring in this part of the city. The most urgent problem of this type is with the left turn to Kołłątaja Str., which although it is a regional road, has no right of way and lights. This often causes large delays for the bus arrival at the stop. There is another big problem with the entry and exit of buses at the bus station. The next problem occurs at the entry to the railway station, where there is also a pedestrian crossing without lights, where people cross as a stream, often with breaks being so short that a car cannot pass. We know from the interview and observation that one car can wait for up to more than one-minute waiting for pedestrians to stop.

Moreover, there is a problem at the intersection of 1 Maja Str. and Armi Krajowej Str. resulting from buses turning at a sharp angle, where they must use the lane excluded from traffic in order to turn. The same is true when leaving Kołłątaja Street, where the bus must cross the second lane to turn. One will need to remove many elements such as booths, existing pavements, roads, greenery, including 5 large trees and a dozen of small ones, and a bunker in order to create the Transfer Point. Pedestrian crossings will be removed to create new ones, and horizontal and vertical markings will be changed.

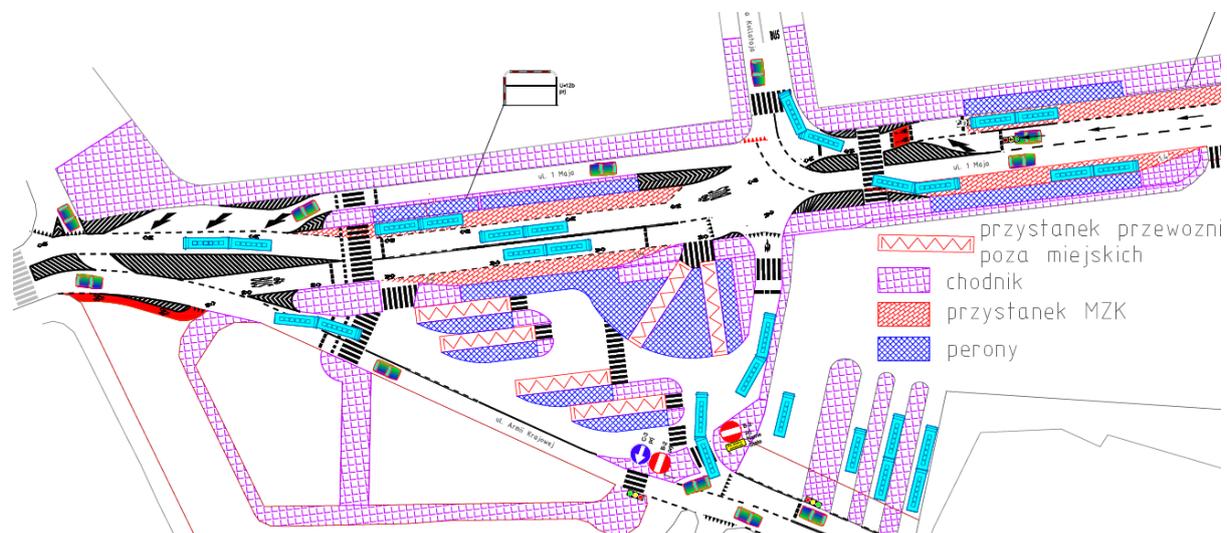
## 5. Conceptual design

The conceptual design takes into consideration the construction of the Transfer Point slab and the organization of traffic around it (Figure 3). The most important change, however, is the conversion of the Kołłątaja Street from one-way to two-way with one direction for buses only. The rest of the changes will be shown in the following sections.

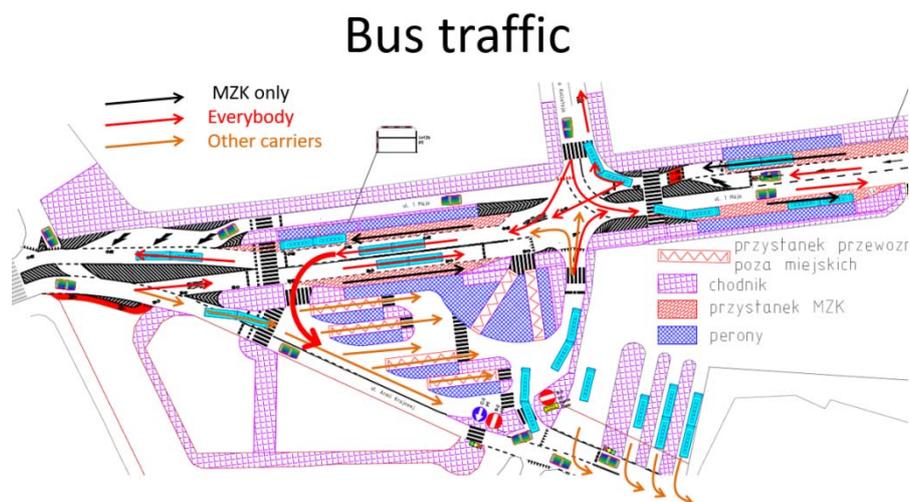
### 5.1. Bus traffic

The whole concept of the Transfer Point and the organization of the traffic around it is based on two main assumptions: separation of car traffic from bus traffic and giving priority to buses. It is important not only to speed up bus traffic, but also to streamline car traffic. To this end, we divided bus traffic into several parts: joint traffic with other participants, traffic for city lines (MZK), and traffic for other

carriers (long-distance). The main traffic for the buses is much shorter than the car traffic because the two-way passage has been designed for it on the reconstructed 1 Maja Str. without a detour (Figure 4).



**Figure 3.** Conceptual design of Small Transfer Point

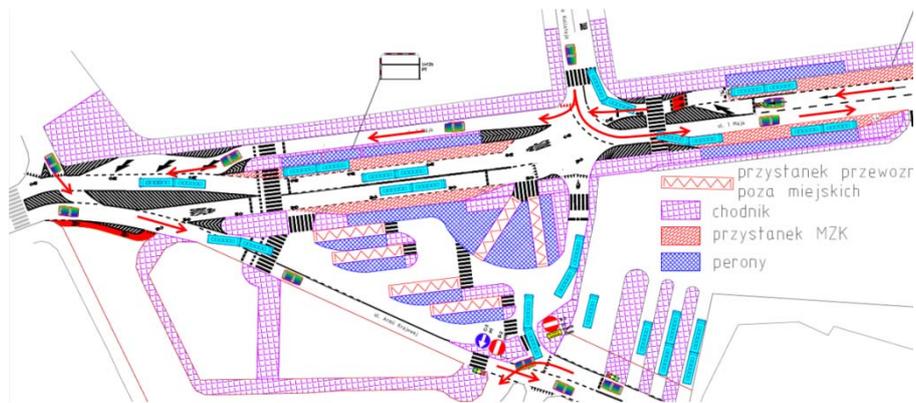


**Figure 4.** Bus traffic

### 5.2. Car traffic

Separating car traffic from the bus traffic will increase the capacity of streets and intersections around the Transfer Point. 1 Maja Str. and Armii Krajowej Str., located directly at the Transfer Point, will be unidirectional for cars, 1 Maja Str. westward from the intersection of Kołłątaja Str. to the junction with Krakowska Str., while Armii Krajowej Str. in the south-east direction from the junction with Krakowska Str. to the intersection with the railway station entrance (Figure 5) from the junction of 1 Maja Str. with Kołłątaja Str. eastward remains two-way.

## Car traffic



**Figure 5.** Car traffic

Cars continuing along Armi Krajowej Str. can do a U-turn using Dubois Street which connects 1 Maja Str. with Armi Krajowej Str. east of the Transfer Point.

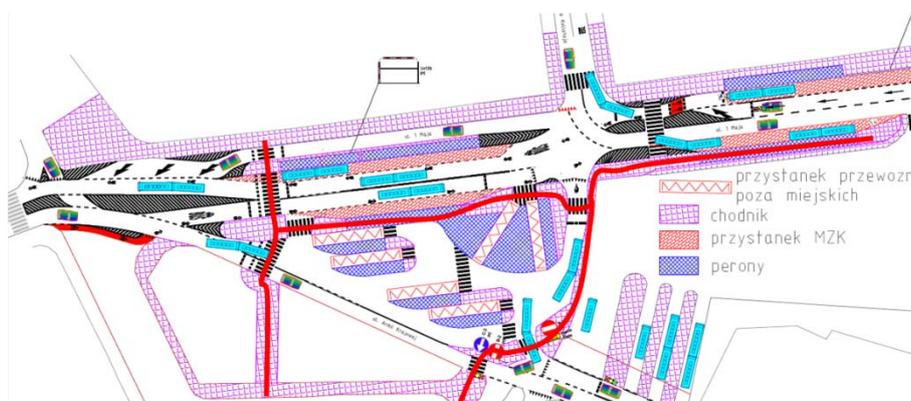
The change of traffic on Kołłątaja Str. from one-way to two-way is important where the northern lane will be the bus lane.

In addition, this change enabled to establish the regional road, which goes via Kołłątaja Str., then 1 Maja Str., as the main road.

### 5.3. Pedestrian crossing

One of the minor assumptions, although quite significant, was the creation of a smooth walking and cycling route from the PKP station towards the promenade on Krakowska Str. and then towards the Opole market. As far as possible, bike paths and pedestrian-bike paths were added. It was equally important to keep the remaining communication routes and to provide access to each platform (Figure 6).

## Pedestrian crossing



**Figure 6.** Pedestrian crossing

#### 5.4. Cycling routes

##### East-West connection

Facilities for cyclists were also prepared. These included the design of a third bicycle lock in Opole, located on 1 Maja Str. before the crossroads with Kołłątaja Str. This lock allows the cyclist to stop on the correct side in front of cars. The cyclist can turn right into Kołłątaja Str. or go straight on the bus lane from there. In order for the path to be readable for cyclists, P-27 signs were used every 20m. The same solution using the P-27 sign is used in the opposite direction. The cyclist driving from the West side goes from 1 Maja Str. on the bike path and then crosses Armii Krajowej Str. on the conditional stop entering the bus lane marked with the P-27 sign at the edge. There are also pictograms on the road and vertical signs to best inform users about the bike path.

Note that the unconditional stop in front of the pedestrian pass is 1.5m for cyclists and 2m for other road users.

##### Southeast-West connection

In the case of preserving the bicycle route to Armii Krajowej Str. the already built pavement at the railway station was used as a bicycle pass starting at the bike path at Armii Krajowej Str. and ending at the crossroads at the exit of the railway station. Two crossings for cyclists were designed at the intersection and a route was connected to an already existing bicycle path at Armii Krajowej Str behind the exit from the bus station (Figure 7).

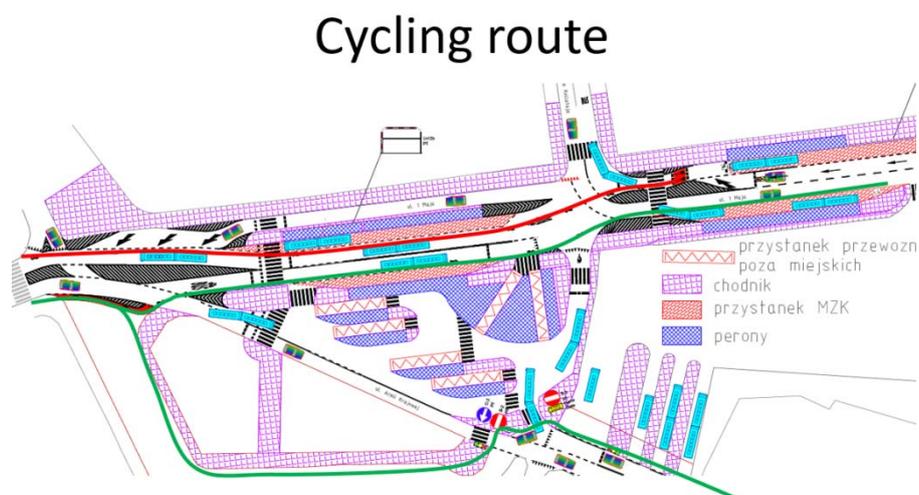


Figure 7. Cycling route

##### Southeast-West connection

There is also a bicycle path with bicycle passes and traffic lights at the main pedestrian route from the railway station.

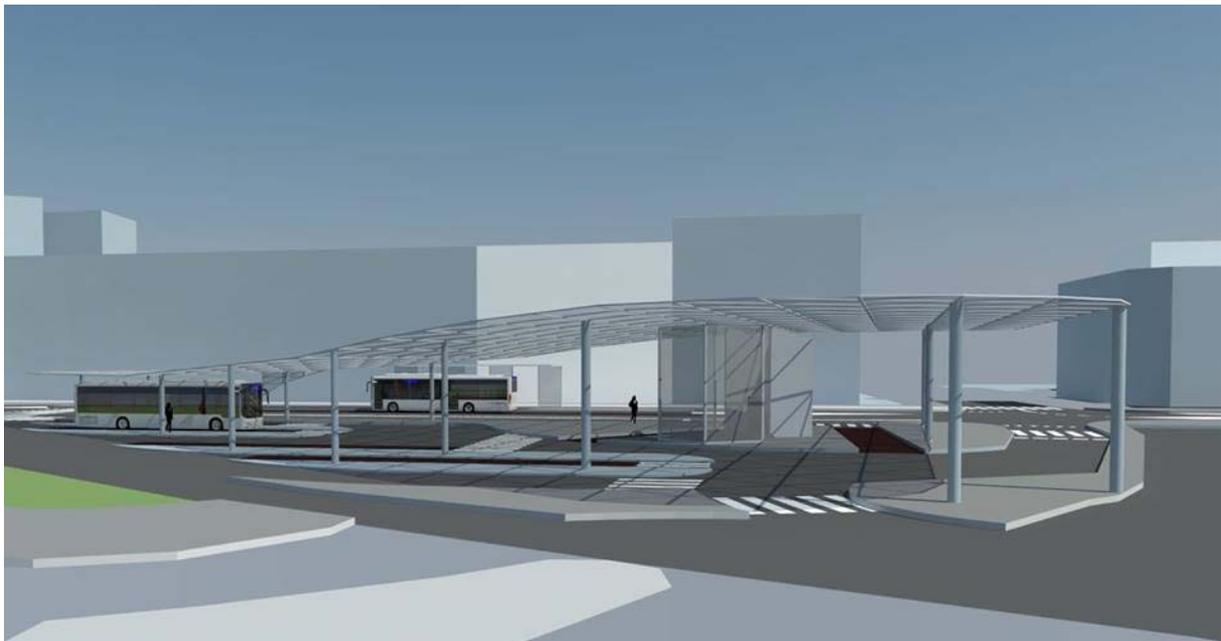
#### 5.5. Solutions for Disabled

The whole area, such as stops, walkways, and infrastructure has been adapted for the disabled. In addition to basic facilities such as acoustic signalling on passes, we have used special paving slabs, rounded curbs, machines for the disabled, benches, lowered passes, elevated platforms, voice announcements, and minor items such as railings, buttons for calling for help, etc. It is important the more so because a hospital is nearby.

### 5.6. Structure and infrastructure

The structure is in the design phase, but the assumption is that there is roofing over the entire Transfer Point and over other stops and platforms with eaves at 1/3 of the width of the bus. The roof will rest on the pillars which are mainly on platforms (Figure 8).

There will be benches, rubbish bins, sound system, information boards, and modern ticket machines on platforms.



**Figure 8.** The visualization of the Small Transfer Point

## 6. Conclusions

Creating a Small Transfer Point with its organization will bring about many benefits. It will not only speed up the movement and transfer of passengers, but also help people with disabilities, and encourage cyclists, which may convince people to leave their cars and use a bike or a public transport instead. The effects of the Transfer Point include:

- Increasing of capacity
- Smoothness of public transport
- Easier and faster transfer
- Creation of bicycle routes
- Creation of safe passes for pedestrians and cyclists
- Adaptation of the entire area for the disabled
- Enabling proper turns for buses
- The right of way on the regional road
- Streamlining traffic at intersections
- Limiting car traffic

## Acknowledgement

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