

SIHL CITY SITE FACTS

Developer: Karl Steiner AG

Architect: Theo Hotz Architects

Developed Area: 4 ha

Construction Began: 2003

Year Completed: 2007

Number of Businesses: 97

Jobs: 2,300

Visitors per Day: 19,000

Visitor Parking Spaces: 800

Allocated Staff Parking: 0

Transit and NMT Combined Mode Share: 67%

Number of Carsharing Vehicle Available: 3



AIRENA

CASE STUDY

Sihlcity

ZURICH, SWITZERLAND

Simon Field, ITDP Europe



BACKGROUND

Sihlcity is a new non-residential retail and leisure development located about 2.5 km to the south of Zurich city center (Figure 1). It is considered best practice because parking is heavily restricted, a result of a policy in Zurich to only allow new development in sites that have adequate access to public transit as well as walking and cycling facilities, thereby deterring new car trips to destinations that might traditionally attract them. The city uses a “trip access contingent model” to determine what policies will help keep car trips below a certain level. In this case the process suggested a reduction in parking supply, and provided incentives for the imposition of high usage costs. Today only 33% of trips to Sihlcity are made by car.

There are 75 shops, 14 cafés and restaurants, a cinema, church, library, hotel, gym and medical centre, as well as high quality public space at Sihlcity (Photo 1). The heart of the development is a four-story mall accommodating almost all of the retail businesses. The site was previously occupied by a paper mill, ceased operations in 1990. In 2003 the land was bought by the developer Karl Steiner AG, which integrated four of the historic buildings into their plans for a new non-residential quarter, named after the River Sihl bordering the site to the east. In 2008 Sihlcity received a European Shopping Centre Commendation, in recognition of the work of Theo Hotz Architects in blending the old and new, as well as the provision of a variety of businesses and services on the same compact site (Sihlcity, 2008).

Large shopping centers are significant trip attractors, and without incentives not to, most people get to them by car. To prevent new

traffic congestion and pollution on the routes to Sihlcity, the City and Canton of Zurich invoked planning regulations to restrict car access a) as a condition of initial planning permission, and (b) in the longer-term after opening.

This strategy includes parking management, better public transportation, improvements to infrastructure for cyclists and pedestrians, and the provision of a sustainable home delivery service.

PLANNING PROCESS

According to the Canton of Zurich Structural Plan, “heavily frequented sites”¹ may only be located in areas that satisfy the following accessibility criteria:

- A maximum distance of 300 m to a rail station served by at least one train per hour, or 150 m to a transit stop served by eight or more trams, buses or trolleybuses per hour;
- Sufficient road capacity in the surrounding area for general traffic;
- Proximity to existing pedestrian routes and cycle networks

Having passed this initial screening, the City of Zurich approved the plans for construction of Sihlcity subject to conditions being imposed on the site owner and developer that include:

¹ Defined by the Canton of Zurich as sites that generate more than 3,000 trips per day on more than 100 days of the year.



Figure 1: Transit routes to and from Sihlcity

- Provision of “recreation quality” space within the site (Photo 1);
- Provision of capital and revenue support for the following public transportation improvements: extension of platforms at Saalsporthalle S-Bahn (urban rail) station, with a new pedestrian subway giving access to the site; construction of a subterranean bus station; operation of bus route 89 and an extension to tram route 5 for two years (Photo 2);
- The development must pay for the construction of new access roads and links to the existing bicycle network on three sides of the site;
- Provision of a bicycle-based home delivery service;
- Parking on the site is capped at a maximum of 850 spaces, all of which must be charged for, plus a cap on car trips to the site (access contingent).

The access contingent model is a mechanism to impose limits on the number of trips made to/from a site by private car in a given period, with stiff financial penalties for non-compliance. This provides an incentive for the owner of a new development to make access by alternative means as attractive as possible. The first step is the calculation of the number of parking spaces permitted, based on the following criteria in the City of Zurich’s parking regulations:

- Floor area per building category e.g. offices, retail, restaurants;
- A reduction factor based on proximity to the city centre;
- A reduction factor based on transit accessibility level;
- A reduction factor where local NOx limits are exceeded;

In Zurich’s central old town district, for example, a blanket reduction factor of 90% applies, i.e. the maximum number of spaces is 10% of the value based on floor space alone. For Sihlcity one parking place was allowed per 110 m² ground floor space, giving a total of 800 spaces.

The “specific trip generation” per space per day, evening period and peak hour is capped under a formula based on the categories of expected visitors. This and estimated price elasticities then inform the level of parking charges (Table 1). The maximum car trip

contingent values for Sihlcity are as follows:

- 10,000 trips per day, decreasing to 8,800 by 2012;
- 1,300 trips at night;
- 800 trips per peak hour.

KEY POLICY AND DESIGN MEASURES

A two-fold travel demand management strategy is in place at Sihlcity: high parking costs to “push” visitors and workers out of private cars, reinforced by parking restrictions in the surrounding area, and high quality local and city-wide transit and non-motorized transport infrastructure to “pull” people onto alternatives.

Parking

Parking management discourages trips to Sihlcity by car: spaces are few and expensive. There are 850 spaces in the on-site multi-story car park, of which 50 are allocated to park & ride season ticket holders, but none to Sihlcity workers.

Parking charges are listed on the Sihlcity website and are in Table 1. A stay of up to four hours costs 7 Swiss Francs (CHF), comparable with the 1–2 zones transit day ticket at 8 CHF. However, residents of Zurich can avail themselves of a range of period passes for one or more zones in the Zurich Verkehrsverbund (integrated transportation authority area), a national travel pass (GA card) or national half-fare card, reducing the real and perceived costs of transit significantly². As there are no discounts for those employed on the site, it is prohibitively expensive to commute by car. Table 1 shows that it costs 20 CHF to park at Sihlcity for an eight-hour working day.

² Over 400,000 GA cards and 2.27 million half-fare cards were sold in 2009; 35% of the Swiss population own one of these mobility passes. Sources: SBB (2009) and FSO (2010).

Table 1: Sihlcity parking charges

Time (hours)	Daytime rate 08:00–20:00 (CHF) *	Evening rate 20:00–08:00 (CHF) *
< 1	2.50	2.50
1–2	3.50	3.50
2–3	5.00	5.00
3–4	7.00	7.00
4–5	10.00	8.00
5–6	12.00	9.00
6–7	15.00	10.50
7–8	20.00	12.00
8–9	25.00	13.50
9–10	30.00	15.00
10–11	35.00	16.50
11–12	39.00	18.00
12–24	39.00	39.00

Sihlcity

* 1 CHF = 0.75 EUR = 0.95 USD

1
Public space
in the heart of
Sihlcity

The Sihlcity entertainment center has an ample amount of public space, as opposed to surface parking lots that are commonly seen in similar centers in the U.S. and Europe.



2

The site developer paid for the extension of platforms at Saalsporthalle S-Bahn station, adjacent to the Sihlcity mall.

3

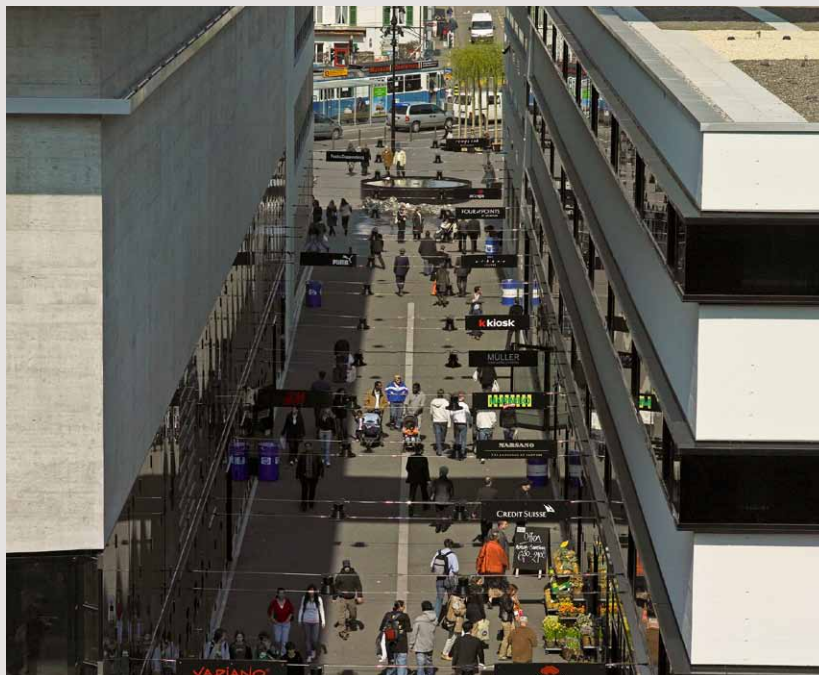
Sihlcity underground bus station, with lift and steps to the main square.





4

Prominently displayed public transport departure information in the heart of Sihlcity.

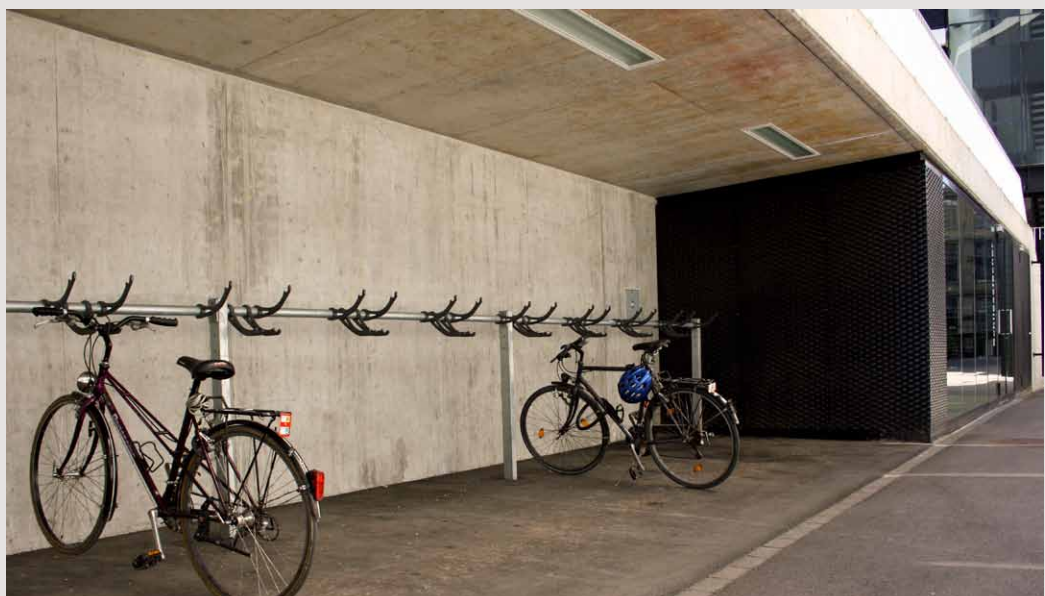


5

The main entrance to Sihlcity from Sihlcity Nord is reserved for cyclist and pedestrians, motorized traffic is prohibited.

6
Bicycle parking next to storage lockers

Customers can store cold groceries while running other errands or take advantage of low-cost delivery service via electric bike.



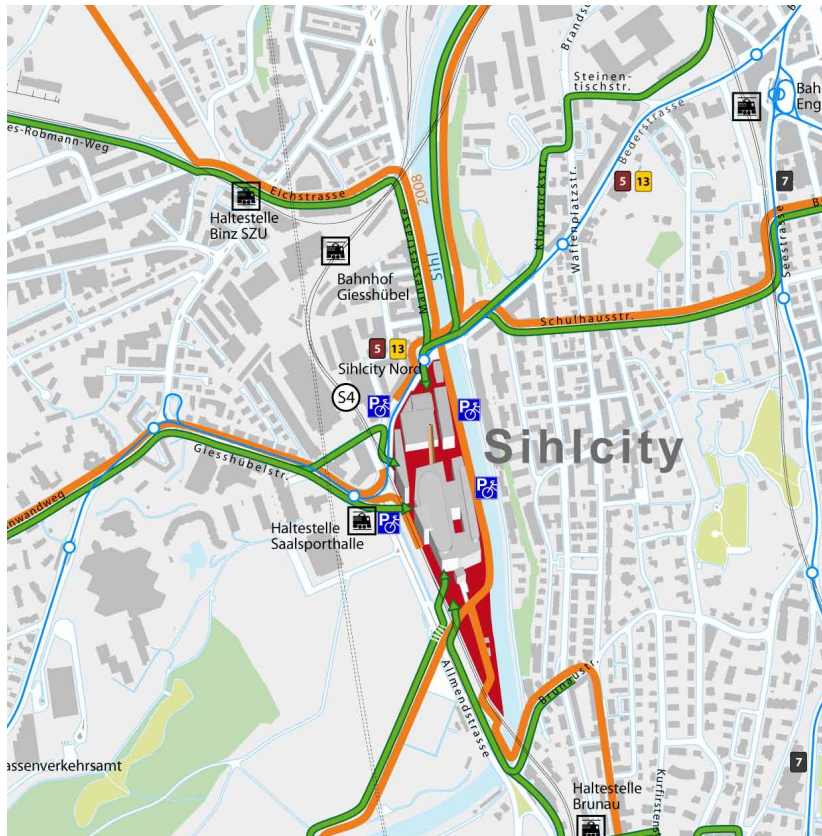


Figure 2: Recommended pedestrian (green) and cycle (orange) routes into Sihlcity

A fine of 50 CHF is payable by vehicle owners attempting to leave without paying the correct fee.

The surrounding area is a controlled parking zone with no on-street parking for non-residents, critical to avoid shoppers or workers from just parking on residential streets and inconveniencing the adjacent community. However, the multi-story car park is directly connected to the mall and the local road network via two new access roads. The A3 motorway from Zurich to Chur can be accessed at a junction 0.5 km to the south of Sihlcity at Brunau. Thus the limited supply and cost of parking is the only policy “stick,” with much greater reliance on the “pull” measures described below.

Public Transportation

The area is very well served by transit, with traffic-free access routes to the most heavily used stops. No part of the development is more than 250 m from Sihlcity Nord tram and bus stop, 150 m from the extended platforms at Saalsporthalle station (Photo 2) and 150 m from the site's own underground bus station (Photo 3). The use of step-free, low-floor vehicles is detailed in Table 2.

Transit routes and frequencies are summarized in Figure 1 and Table 2. As in most European cities, a Zurich ZVV single trip ticket allows unlimited changes to reach one's destination, minimizing the inconvenience of interchange. Trams, buses and trains are timed to connect at many hubs, as is the case across much of Switzerland. Printed timetables, maps and fare information are displayed at all stops and in the central public square, with electronic departure boards located on the square and inside the mall (Photo 4).

A comprehensive network of tram and suburban rail (S-Bahn) services form the backbone of Zurich's transit system, complemented

by buses and trolleybuses serving lesser-used and orbital routes. Routes, timetables and fares are set by the ZVV Verkehrsverbund (transit agency), which is also responsible for information provision and marketing, allowing full intra- and inter-modal integration across the city region: the slogan “one ticket for everything” is part of the ZVV logo. The municipal operator of the city's tram and bus network, VBZ, has heavily marketed the improved transit service to Sihlcity, focusing on the comfort and frequency of tram routes 5 and 13 with the slogan “changing makes sense.”

There are location maps, route maps and timetables at all stations and you can purchase the most popular tickets with coins at most stations. An increasing number of city centre stops have touch-screen machines offering a greater variety of passes and destinations: these accept coins, credit and debit cards, and will eventually replace the coin-only terminals.

Heavily-used stops feature electronic departure boards, some of which can display real-time information. All stops are shown in the online mapping service Google Maps, together with the times of the next two departures per route and links to full timetables on the ZVV website. Real-time next stop and connectional information is announced, and in most cases displayed electronically, in trams, trains and buses.

Zurich has a zonal fare structure, with a range of personal (non-transferable) and transferable monthly and annual passes available for either (a) travel without restriction, or (b) travel at any time outside the hours of 05:00–09:00 on weekdays: the latter cost half the price of the unrestricted versions, starting from 693 CHF, or 519 EUR, for the annual personal pass covering the entire metropolitan area. 75% of Zurich residents possess at least one transit season pass

Table 2: Transit routes to and from Sihlcity

Route	Sihlcity stops served	Details	Mon–Fri peak frequency	Mon–Sat off-peak frequency	Sunday frequency	Step-free vehicles?
Train S4	Saalsporthalle	City radial routet	Mon–Fri peak frequency	20 mins	20 mins	No
Trams 5 and 13	Sihlcity Nord	City radial route	3–4 mins	3–4 mins	10 mins	Some
Trolleybus 33	Sihlcity Nord	City inner orbital route	6.5 mins	7.5 mins	10 mins	Some
Bus 89	Sihlcity (bus station)	City outer orbital route	7.5 mins	15 mins	No service	Yes
Postbuses	Sihlcity / Saalsporthalle	To/from rural hinterland	30 mins	Mostly hourly (no Saturday service)	No service	Yes

Author's elaboration

(Stadt Zürich, 2007). Books of six one-day and single-trip tickets are also available. A Junior Travelcard costing 20 CHF per year allows accompanied children up to the age of 16 to travel free. Carsharing membership can be bundled with these options.

Bicycles can be carried on buses, trolleybuses and trams subject to space, and on S-Bahn trains at off-peak times.

The electricity generation mix across Switzerland as a whole is 55% renewable (largely hydro-electric) and 41.1% nuclear³, while that of the national railway system is 73.5% hydro-electric and 26.5% nuclear. This clearly demonstrates the value of modal shift from the car to electrified transit in particular, as a core element of the Swiss climate change mitigation strategy.

Pedestrian and Cycling Infrastructure

Within the site, the main access route from Sihlcity Nord and the central public square are free of motorized traffic and shared by cyclists and pedestrians (Photo 5). Access from the west is via a new subway under Saalsporthalle station: this and the southern access point are linked to existing cycle paths via newly constructed paths. Access routes for pedestrians and cyclists (Figure 2) are described in a printed leaflet, and were available to download from the Sihlcity website until September 2010.

Bicycle lanes in the surrounding area are either on the road, separated from other traffic by yellow painted lines, or on the pavement (sidewalks), especially at the busy Sihlcity Nord junction. A dedicated traffic-free route runs along the river for approximately one kilometer towards the city centre: detailed printable and audio guides for leisure walks from the city centre are downloadable from the Sihlcity website.

Bicycle use is further encouraged through the provision of 600 covered parking spaces in four locations across the site (Photo 6).

Storage Facilities and Home Deliveries

Many people drive to shopping centers because it is usually the easiest way to transport purchases back home. Sihlcity offers a number of innovative services to encourage the use of sustainable modes by shoppers.

Storage lockers of varying sizes are available on-site, with modest fees of no more than 4 CHF for up to six hours. An innovation

demonstrating Sihlcity attention to detail is the provision of lockers chilled to 12°C, ideal for the storage of fresh and dairy produce.

A bicycle-based delivery service for groceries and other small items of up to 40 kg is provided through the community association Züriwerk, which provides opportunities for disabled people in Zurich. Goods, including chilled perishables, can be left with Züriwerk at any time between 09:00 and 20:00, avoiding the need to rent a locker, with the actual delivery taking place at a time of the customer's choosing. The standard price is 8 CHF to any destination within the city. Deliveries averaged fifty per day in 2009, up from twenty in within the first hundred days of opening.

Carsharing

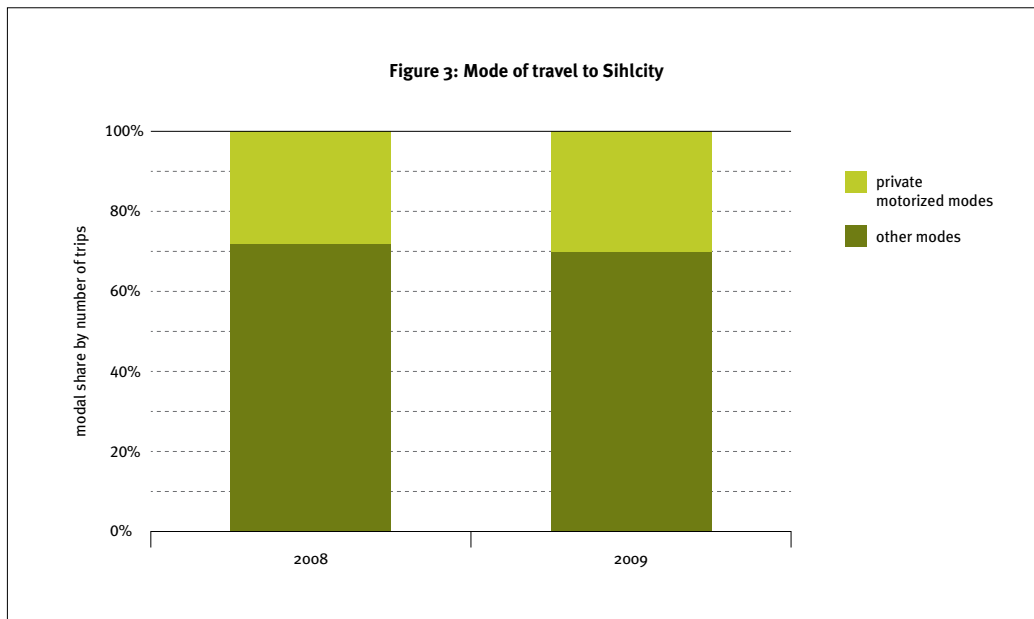
Three carsharing vehicles, including one station wagon⁴, are available to rent from the park & ride area of the car park through Mobility Carsharing Switzerland. The annual membership fee is 290 CHF, or 150–190 CHF for holders of national or regional annual transit passes. Members pay between 2.70 and 4.20 CHF per hour, and a distance fee of between 0.25 and 0.92 CHF per km, depending on vehicle type and total distance travelled. Vehicles can be located and reserved online and by telephone. More information, including eco-driving tips, is available on the Mobility Carsharing website.

This organization offers cars at 190 sites in the City of Zurich, and at a total of 379 sites in Zurich Canton, putting a large proportion of the population within easy reach of one. Over 10,000 people hold a combined ZVV annual public transportation and Mobility membership pass, for an additional fee of 150 CHF, plus the hire charges outlined above. Interestingly, a separate tariff for infrequent users is also offered: bundled membership is available for only 25 CHF, with users paying an extra 1 CHF per hour when using a vehicle. This discourages frequent use if a reasonable alternative is available.

Unfortunately the cars are not available for one-way hire, requiring users to return them to Sihlcity: this implies additional trip generation rather than substitution. Unsurprisingly, use of these vehicles is low, with 1,040 recorded trips per day from Sihlcity in 2009, equivalent to about three trips per day, or one per vehicle (Schmid, 2010; pers. comm.). Alternatively, members can pick up vehicles in their own neighborhood, then drive to Sihlcity and back, although they face the same parking charges as other car users. The marginal effect

³ 0.005 kg CO₂ / kWh. Source: Ecopassenger (2010).

⁴ Estate or combi car.



De Tommasi, 2008;
De Tommasi, 2009

Table 3: Quantitative comparison of the Sihlcity and Letzipark leisure and retail developments.

Site	Number of shops	Number of restaurants and cafés	Number of parking spaces	Cost of parking for three hours	Distance to tram stop	Distance to rail station
Sihlcity	75	14	850	5 CHF	250 m via traffic-free route	On-site
Letzipark	57	9	1,500	Free	250 m via busy streets	800 m

Author's elaboration

of Sihlcity carsharing vehicles on travel demand might be negligible, or even slightly adverse, but the overall impact of membership on car ownership and vehicle kilometers travelled should be considered when assessing the efficacy of carsharing. Mobility Carsharing Switzerland has 90,000 members, with an estimated 18,000 fewer car movements per day as a result (*Mobility Carsharing Switzerland website, accessed 15 July 2010*).

QUANTITATIVE ANALYSIS

Prior to the opening of Sihlcity, 1,350 people (boarders and alighters) used Sihlcity Nord tram stop per day. This more than doubled to an average of 3,100 per day within the site's first 100 days of business. User surveys estimated that non-car modes accounted for 70% and 67% of visitor trips in 2008 and 2009 respectively, comfortably beating the target of 60% (Figure 3) (*Sihlcity, 2010*). This compares with the national figure of 8–9% of shopping trip stages being made by transit in 2005 (*FSO, 2009*).

These data are not split further into transit vs, cycling or walking, but it is likely that transit dominates: City of Zurich statistics reveal that 64% of all trips involving two or more modes (including walking) include a transit component (*Stadt Zürich Tiefbauamt, 2008*).

The car park has spare spaces on weekdays, but fills to capacity on Saturdays. Car users stay for 2.5 hours on average, paying 5 CHF to do so. Of the daily limit of 8,800 car trips allowed under the trip

contingent model, approximately 3,600 were made in 2008. Average car occupancy is 1.6 persons, consistent with the national figure for Switzerland. 30% of visitors used a car in 2009, compared with 38% for all shopping and leisure trips in Switzerland. Although there are no data available, it is highly likely that car use among Sihlcity workers is negligible owing to the lack of free allocated car parking.

An interesting comparison may be made with the Letzipark shopping centre, located 2.5 km to the north-west of Zurich city centre (Table 3).

Unlike Sihlcity, Letzipark is geared towards serving motorists: a petrol station and car dealership are located on-site. Public transportation comprises a radial trolleybus route, an orbital bus route and a local bus feeding the tram system. Access to high quality rail-based public transportation is considerably less convenient than in Sihlcity. More importantly, the Letzipark website (*accessed 26 October 2010*) boasts of 1,500 parking spaces, despite its smaller size, which are free to use for up to three hours. "Women only" bays are located close to the exits, increasing the attractiveness of multi-story car parking at night. The "how to get here" pages of each website are noticeably different: Letzipark's displays information for car users, with a separate link to a transit route planner, whereas Sihlcity's offers more detailed public transportation information alongside transit and car route planners. The walking and cycling map shown in Figure 2 was available on the Sihlcity website (*accessed 14 July 2010*), but has subsequently been removed.

LESSONS LEARNED

Encouraging the use of sustainable modes for shopping trips is a major challenge, especially when bulky or heavy loads are purchased. Nevertheless, the City of Zurich and Sihlcity have addressed this issue by (a) using the price and limited supply of parking as the key policy tool to deter private car use, and (b) providing improved transit, storage and delivery alternatives that people find convenient to use. This was facilitated through the planning system, including the City's stringent planning regulations for heavily frequented sites: planning permission was conditional on satisfying accessibility planning, maximum parking standards and car trip contingent criteria. This is a model that other cities could adopt as part of their spatial planning strategies and guidance.

The Sihlcity strategy relies on a large proportion of visitors already owning one of the many types of integrated transit pass available (from 1.90 CHF per person per day), since the cost of undiscounted one-day tickets within the city for a family of four (27.20 CHF), plus bicycle-delivery (8 CHF), compares poorly with the 3–4 hour parking fee of 7 CHF, or 7-hour stay for 15 CHF. Although there are fuel and vehicle maintenance costs to consider, these are generally perceived by car users to be negligible in terms of marginal trip costs. The carsharing vehicles on site are a useful back up for car-free visitors who may have made more or heavier purchases than anticipated, but do not contribute to a reduction in motorized vehicle kilometers. A better solution for retail centers might be just increased availability of taxis and the creation of a taxi stand at a central location for customers who are too laden down with packages to take other modes.

The use of non-motorized modes to access Sihlcity is believed to be relatively low. Possible ways to address this are the use of personal travel planning and awareness-raising campaigns on site. Free bicycle trailer hire could also help: this is offered by the British supermarket chain Waitrose and would be simple to integrate into the Züriwerk delivery facility.

Expanding the use of low-floor vehicles on transit routes to/from Sihlcity may help maintain or even expand the already high number of people who use transit to reach the site. Happily, the transit agency has a strategy to convert S-Bahn route S4 by 2014 and eliminate remaining high-floor trolleybuses by the end of 2013 (ZVV, 2008): this will improve accessibility for those laden with shopping bags and using pushchairs, as well as the elderly and disabled. In contrast, the key priority for the tram system is expansion, including the "Glattalbahn" tram network in the north of the city, rather than the replacement of older vehicles or the addition of low-floor centre sections to a further batch of "Tram 2000" vehicles. However, the Swiss Disability Discrimination Act requires that transit buildings and vehicles be fully accessible to the disabled by the end of 2023 (*Federal Office of Transport, 2006*).

In terms of the transferability of the Sihlcity experience, a prerequisite is a comprehensive, frequent, reliable, affordable, clean and comfortable transit system. Simply increasing the cost of parking alone is unlikely to be successful, given the availability of alternative retail and leisure facilities with free or low-cost parking. ■

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Image credits

Figures 1, 2: Sihlcity.

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Photo 5: Sihlcity

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