

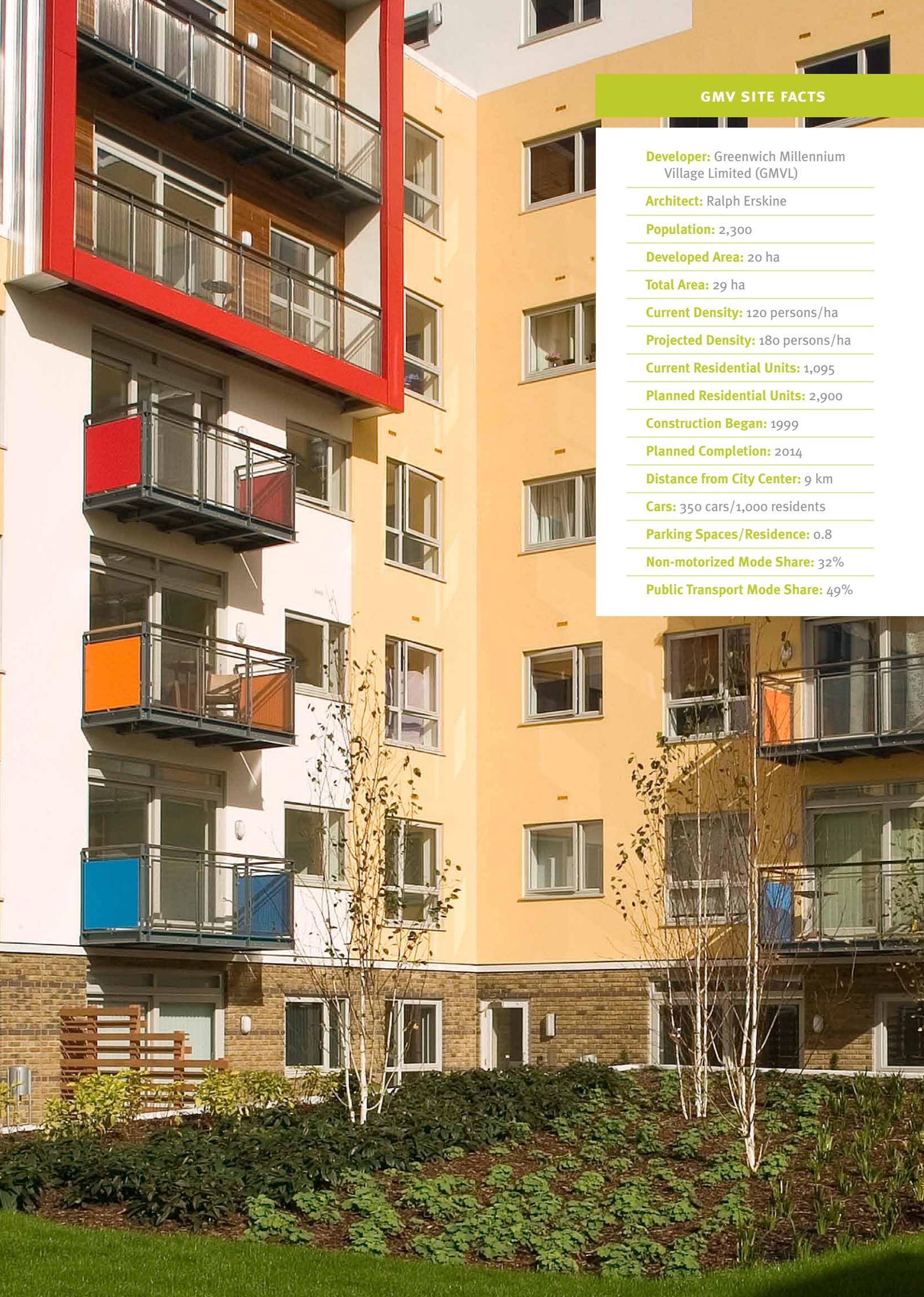


CASE STUDY

Greenwich Millennium Village

LONDON, UNITED KINGDOM

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GMV SITE FACTS

Developer: Greenwich Millennium Village Limited (GMVL)

Architect: Ralph Erskine

Population: 2,300

Developed Area: 20 ha

Total Area: 29 ha

Current Density: 120 persons/ha

Projected Density: 180 persons/ha

Current Residential Units: 1,095

Planned Residential Units: 2,900

Construction Began: 1999

Planned Completion: 2014

Distance from City Center: 9 km

Cars: 350 cars/1,000 residents

Parking Spaces/Residence: 0.8

Non-motorized Mode Share: 32%

Public Transport Mode Share: 49%

BACKGROUND

Greenwich Millennium Village (GMV) is an excellent example of mixed-use, brownfield redevelopment, well-served by transit, with strict parking regulations and a layout that limits through car traffic (Photo 1). While car ownership rates in the development are only marginally better than in the surrounding area, car use is significantly lower.

GMV is located on the Greenwich Peninsula, a 121-hectare brownfield redevelopment site formerly occupied by the town gas works, on the southern banks of the River Thames in southeast London, about 9 kilometers from the London city center. In 1997 English Partnerships¹ committed to transforming the Peninsula, one of the largest development sites in London, into a new residential community. The regeneration project is currently in phase one of a twenty-year build program, which will see 10,000 residential units, leisure and retail facilities, as well as educational and health centers. GMV occupies 29 hectares on the south-eastern side of the Greenwich Peninsula.

The project was the first “Millennium Community” to be identified by English Partnerships and is being developed by Greenwich Millennium Village Limited, a joint venture between Countryside Properties and Taylor Wimpey. The Millennium Communities Programme was launched by English Partnerships alongside the Department for Communities and Local Government to create seven exemplary sustainable communities nationwide. Each of the seven communities is to incorporate high-density housing, green spaces, good transport links, and easy access to shops and recreation facilities, producing quality places where people want to live. In order to ensure that sustainability goals are met, the Millennium Communities Programme has set standards for energy efficiency, water consumption, transport, building defects, recycling and health and safety on site. In line with these goals, the housing at GMV is of modern, environmentally-friendly design, and the development aims to cut primary energy use by 80%, compared to traditional developments of similar size, using low-energy building techniques and renewable energy technologies. Finally the project aims to reduce car dependency by giving priority to cyclists and pedestrians, providing access to high quality public transportation, and restricting and pricing car parking (Photos 2 and 3).

London is one of the largest and most congested cities in Europe, it has also been on the forefront of fighting congestion in part by reducing demand for private car use. While policies like congestion charging have been successful in Inner London, car use remains prevalent in Outer London. Therefore it is important for developments such as GMV, located outside the city center, to implement strategies aimed at reducing car dependency.

GMV is marketed as an experiment in sustainable development. New residents are given a packet of information on sustainable living when they move in. Various studies have shown that residents support the concept and ethos of the village. Further, they appreciate the

sustainable design features and enjoy being part of the special community, demonstrating the project’s success not only as a sustainable development, but as a liveable community as well (*Cherry and Hodkinson 2009*).

To date, 1,095 homes, a primary school, a health center, an ecology park and a village square with shops have been completed, on 20 hectares (Figure 1). All of the residential units are currently occupied.

The homes completed include a number of live/work units and a wide range of affordable housing. Developers plan to continue expansion of GMV until 2014, including additional housing, retail, and a community center, with a total developed area of 29 hectares for the entire village (*English Partnerships Website*).

PLANNING PROCESS

In 1997, English Partnerships launched a competition to design and build Greenwich Millennium Village, the first community in the Millennium Communities Programme. The competition was won by Greenwich Millennium Village Limited (GMVL), a joint venture between Countryside Properties and Taylor Wimpey. English Partnerships and GMVL signed a Section 106 Agreement (see *Section 106 Agreements* sidebar, p. 11) in which GMVL agreed to build a sustainable mixed-use residential development of 1,400 dwellings

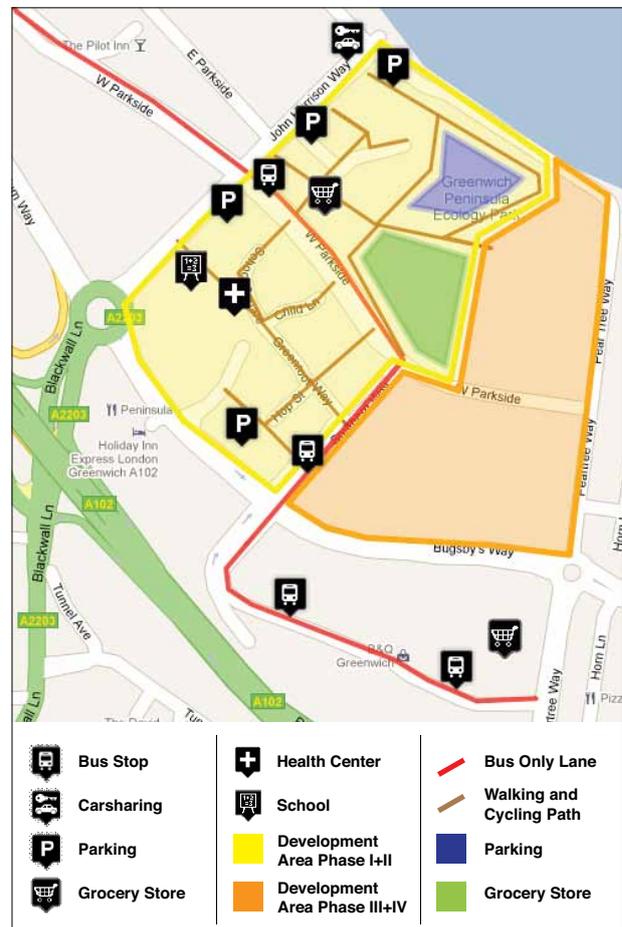


Figure 1: Map of GMV

¹ English Partnerships was a non-departmental public body funded through the Department for Communities and Local Government. It was responsible for land acquisition and assembly and major development projects, alone or in joint partnership with private sector developers. In December 2008 its powers passed to a successor body, the new Homes and Communities Agency.

with 20% designated as affordable housing. For the affordable housing portion of the development, GMVL is working in association with social housing partners Moat Housing. GMVL also agreed to contribute a specified sum for bus improvements in the area and to submit a parking garage management plan.

In return, English Partnerships agreed to fund the Millennium Busway, a bus only lane running through the development, as well as a state of the art integrated school and health center, which opened in 2001 (see Figure 1). English Partnerships also agreed to produce an annual travel monitoring study including analysis of mode split and parking demand of GMV residents in addition to a strategy plan for reducing car use.

Construction of GMV began in 1999 and the first homes were occupied by 2000. Phases 1 and 2 of the building process were completed by 2002, producing 1,095 residential units, a village square with shops, an artificial lake and an ecology park.

In 2006 a new Section 106 Agreement was signed between the Greenwich Peninsula landowners, English Partnerships, and GMVL. This agreement increased the planned development size from 1,400 to 2,900 residential units and increased the required share of affordable housing from 20% to 35%. The agreement laid out the plans for Phases 3 and 4 of the development which will include construction of around 1,800 additional new homes, 15,000 square feet of retail spaces, 70,000 square feet of work space, a community center and a nursery. The planned completion date for Phases 3 and 4 is 2014 (*English Partnerships Website*).

KEY POLICY AND DESIGN STRATEGY

The Millennium Communities Programme has recognized reduced car dependency as a key sustainability issue. This is especially apparent in the city of London which has limited room for additional parking spaces and a high level of traffic congestion. Spurred by these concerns, GMV has incorporated several transportation demand management strategies aimed at reducing car dependency and promoting other, more sustainable forms of transport.

Parking

As part of its strategy to reduce car dependency, motor vehicle parking at GMV is restricted and generally located away from individual properties. Parking spaces are only available for 80% of units. Two floors of parking garage are located beneath two of the apartment buildings built during Phase 1. In Phase 2, car parking facilities were separated from apartment units and located at the edge of the development. Overall there are 884 parking spaces in the development.

Further, parking spaces are unbundled from apartment units, so residents who choose to have a parking space must pay for it separately from their residence. Residents don't pay for a specific parking space, but rather for a "right to park," which means they can enter the parking garage and must then search for an available space. Prices per space have gone up since the development was first built, but the current price is 17,500 GBP per parking space (*Marcello Burbante, pers. comm.*).

Only residents who have purchased a space are allowed to park in the garages; visitors are not allowed. Visitors are expected either to park temporarily in the bays on the main roads, which are frequently ticketed by the council, or in the public parking lot next to the North Greenwich transit station located 0.8 kilometers northwest of GMV.

SECTION 106 AGREEMENTS

These agreements refer to Section 106 of the British Parliament's Town and Country Planning Act of 1990, which regulates the development of land in England and Wales. Section 106 permits local authorities and developers to make agreements over the use of land, including planning obligations by the developer to contribute towards sustainable communities and offset the costs of the external effects of the development. Contributions by the developer may include cash, infrastructure investments or provision of services. Examples include provision of new schools, public space, affordable housing, new roads and public transport. Section 106 agreements are legally binding and are linked to the granting of planning permission. Each agreement is different and depends on the unique needs of each community. Some agreements may include measures aimed at reducing transport-related emissions. Transport-related measures that have been included by the Greenwich Council (specifically for the Woolwich Town Centre Development) include: provision of carsharing, controls on parking permits, emission-related parking charges, provision of electric vehicle charging points and use of bio-fuel in delivery vehicles (*Birch 2010*).

However, during school holidays people are informally allowed to park in the school's parking lot. In addition, residents often rent out their spaces to neighbors during the winter holidays by advertising on bulletin boards in the shared spaces. In this way, residents have taken it upon themselves to manage the existing parking supply as efficiently as possible, treating it as a valuable commodity.

Cycling and Pedestrian Infrastructure

On the flip side, GMV strives to promote cycling and walking. A network of cycle and pedestrian routes runs throughout the village and beyond, connecting the development to the surrounding areas. For example, a pedestrian walkway leads from GMV to The O2 Arena, a large sports and music venue located in the Millennium Dome on the northern side of the Greenwich Peninsula. Within GMV, secure bicycle storage facilities are provided for every housing unit and 2–3 bicycle parking spaces are available per unit, including several covered, weather-protective bicycle parking facilities (Photo 4).

Carsharing

Two carsharing vehicles, provided by Streetcar, are located just to the north of GMV (*Streetcar Website*). These vehicles are located in a car bay on John Harrison Way, which borders GMV. In addition, two Streetcar carsharing vehicles are located in a parking lot off of Tunnel Avenue, about half a kilometer south of GMV. Other than these four



1
Greenwich
Millennium
Village

2
North
Greenwich
Transit Station

The Underground is the most popular mode of transport for GMV residents. The new station was built to allow for larger volumes of passengers and provides direct connection between the Underground and 8 bus routes.





3
Millennium
Busway

The Millennium Busway runs from the station through GMV, with two stops located within the village.



4
Bicycle
parking

Secure bicycle storage is provided for every housing unit, and 2–3 bike parking spaces are available per unit.

vehicles, no other carsharing vehicles from any other companies are located on Greenwich Peninsula. There seems to be a potential to locate more carsharing vehicles on this site, particularly inside the GMV parking garages themselves.

Urban Design

GMV was designed by masterplanning architect Ralph Erskine to be a modern urban village, incorporating high density residential units with green public spaces and providing opportunities for leisure activities and shopping. Erskine was known for his preference for design with limited through car traffic. He also worked on the Boo1 car-free development in Malmö. In line with these principles, Erskine's vision for GMV was to create a community where the pedestrian has priority over the car.

Street Layout and Design:

Main thoroughfares run along the northwest and southwest borders of the development. Further, two main thoroughfares run through GMV. West Parkside bisects the development, while Southern Way splits off from West Parkside midway through the development and runs southward. A two-lane dedicated busway which starts at North Greenwich station passes through the village along West Parkside, turning onto Southern Way (Figure 1). The busway is separated from car lanes by a green median. The busway is distinguished by its brick-red color. On the south side of the village is a road that leads to the school parking lot. Other than these roads, the development is car-free and priority is given to cyclists and pedestrians.

Public Space Design:

Provision of public spaces was an important component of the design. The village includes an ecology park, a village square and landscaped courtyards. The ecology park, covering 0.2 square kilometers, includes two lakes and a thriving wildlife population. In addition, garden squares are located through-out the residential areas. The design gives priority to the cyclist and pedestrian, providing pedestrian and cycling

pathways separated from motor vehicle traffic throughout the village. Furthermore, safety is enhanced through monitoring of transit stops, cycle routes and pedestrian areas by CCTV.

Land Use Planning and Design:

GMV was designed from the beginning as a mixed-use development combining residences, retail, commercial and leisure spaces. Phase 1 of the development consists of blocks of flats 8-10 stories high, surrounding inner courtyards, with two floors of parking garages beneath. The highest buildings are located on the northern side of the development, along the Thames River, to provide more waterfront views. Phase 2 includes a mix of lower rise flats up to six stories and terraced houses situated around public squares with car parking in a separate block at the side of the development. The residential units include a mix of tenure types.

The village square is located near the center of the development, conveniently located within walking distance of residential units so that residents can easily conduct shopping trips and errands by bike or on foot. The uses in the village square include a small grocery store, a pharmacy and several cafes. Overall, the development includes 4,500 square meters of commercial space along with community facilities such as a school and health center (*Countryside Properties Website*).

QUANTITATIVE ANALYSIS

The policy and design measures used by GMV work. GMV has a much higher residential density than the Greenwich District, in which it is located, or London as a whole. And GMV residents are far less likely to use a private car (18%) as compared to their Greenwich neighbors (44%) or Londoners overall (42%). The car ownership rate per resident is also lower for GMV than for London (Table 1).

Table 1: GMV as compared to surrounding area

	GMV	Greenwich	London
Population	2,300	223,000	7,600,000
Area (ha)	20*	4,700	170,000
Population density (persons/ha)	120	47	45
Residential units	1,095	100,000	3,000,000
Cars per 1000 residents	350	350	370
Car parking spaces / residential unit	0.80	NA	NA
<i>Mode share for all trips</i>			
Car	18%	44%	42%
Public transit	49%	29%	25%
Bicycle	4%	1%	2%
Walking	29%	26%	31%

Rutherford, 2005;
Transport for
London, 2009

* current developed area

Car Ownership Rates

Figure 2 provides a comparison of car ownership rate per household for various segments of London. The rate for GMV falls between that of Inner London, where households are generally less car dependent, and that of Outer London, where households are typically more car dependent. The rate for GMV also falls below that for London. These figures demonstrate that many households in GMV choose to live car-free, although the car ownership rate is still not quite as low as it is in Inner London.

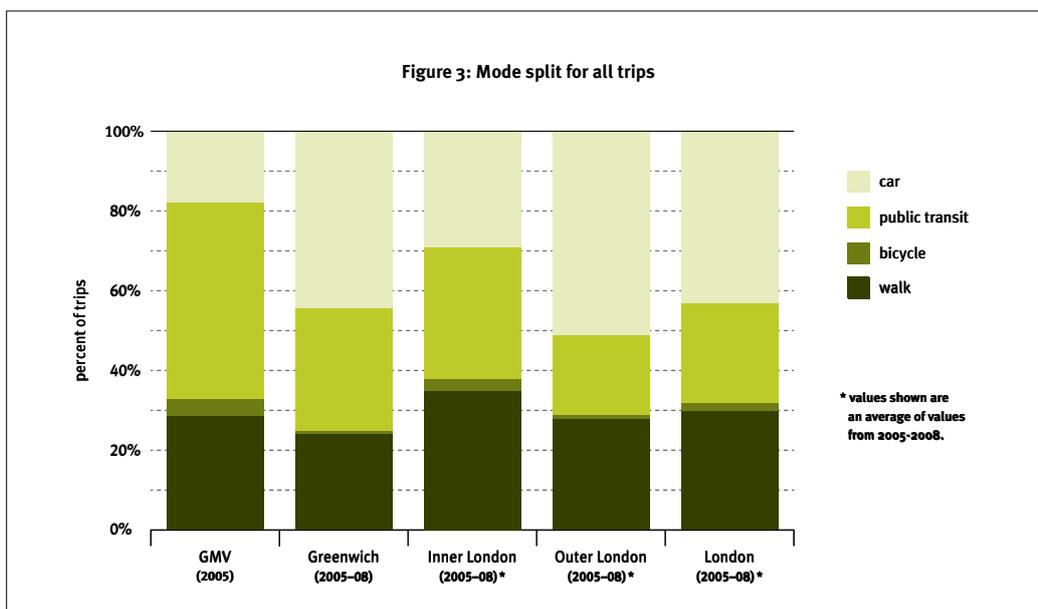
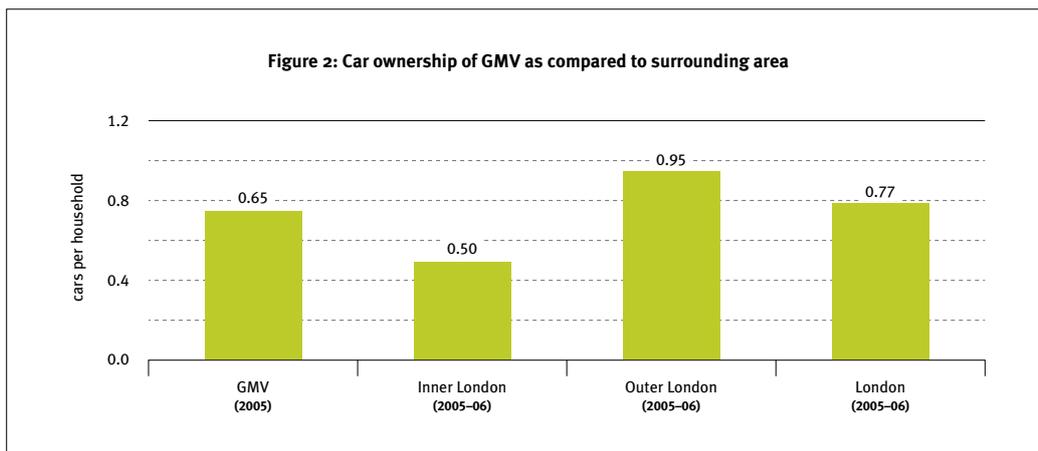
Mode Split

However, while car ownership in GMV is higher than for Inner London, car use in GMV appears to be much lower than for other areas of London, even Inner London. As seen in Figure 3, only 18% of trips made by GMV residents are by car, which is much lower than for Greenwich (44%), Inner London (29%), Outer London (51%) and London (43%). The GMV data was collected through a survey of residents conducted to fulfill the requirements for the Section 106 Agreement, and included in the Travel Monitoring Study 2005 Report.

Public transit use is high in GMV, particularly for trips to work. Indeed, the majority of GMV commuters (79%) travel to work by public transit. The breakdown by type of public transport shows that 73% of commuters travel to work by London Underground. This is not surprising given GMV’s easy access to the Jubilee Line, connecting the development to central London, and the high cost of driving to central London due to the city’s congestion charge. Figure 4 shows that a much larger proportion of GMV residents (79%) commute to work by public transit than Inner London residents (59%), Outer London residents (38%), and overall London residents (46%). Further, the proportion of GMV residents commuting to work by car is very low.

Although a small proportion of GMV residents walk or cycle to work, a much higher number walk or cycle for other trip purposes such as traveling to school and shopping (see Figure 5). Nearly one-third of those who study walk to school, however, almost a quarter drive. These results are likely due to the mix of student types; children are more likely to walk or cycle to school within the village while adults taking classes outside the district might be more likely to drive.

Further, while about half of residents use their car for their main

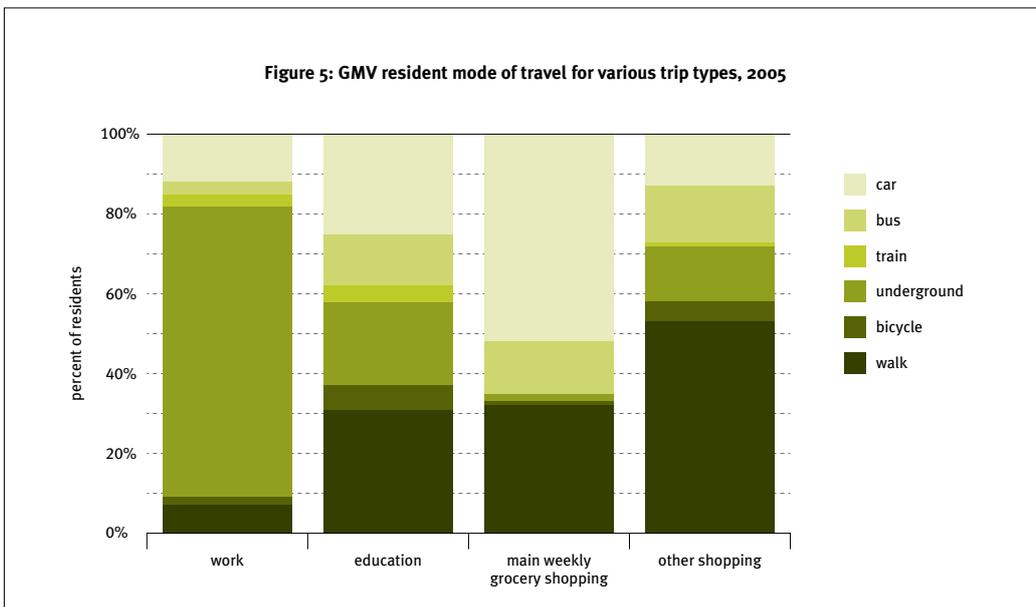
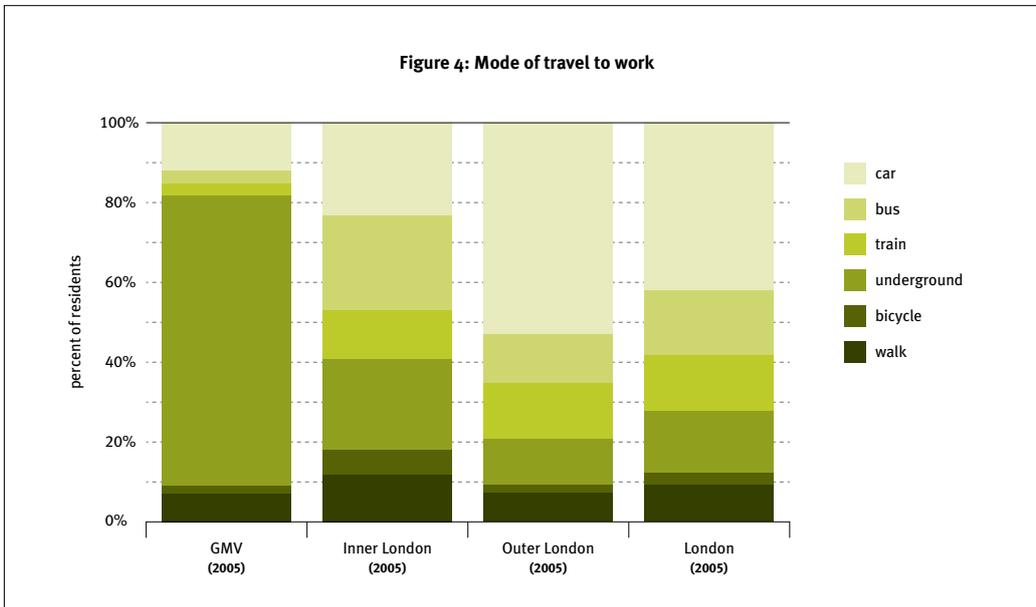


weekly food shopping trip, one-third walk or cycle for this trip. Many may travel to Sainsbury's for this trip, the first low energy food store in Britain, which is located just south of GMV (within one kilometer of most residences). The store is 50% more efficient than a standard supermarket, incorporating use of natural light, high levels of insulation, passive ventilation and under-floor heating systems (*GMV Website*). However, while the supermarket has a focus on energy sustainability, it seems to have overlooked transport sustainability as it caters to the car; the store is located next to an extensive parking lot with more than 300 free to use spaces. The ease of accessible parking might encourage GMV residents to drive to the store rather than cycle or walk. The store is also accessible by bus; however, Figure 5 shows that few residents travel by bus to the grocery store.

Not included in Figure 5 are those who have groceries delivered. The resident survey found that eight percent have groceries delivered to their residence (*Rutherfords 2005*). This reduces the number of trips made by residents, but the effect on carbon footprint of these trips depends on delivery vehicle fuel and scheduling efficiency.

In addition, more than half of residents walk or cycle for other shopping trips. Providing a wide variety of shops in the village makes it more convenient for residents to walk for these trips. The survey of residents was taken in 2005, and the number of shops in the village square has been expanded since that time, so it is likely that a more current survey would show a higher proportion of walking and cycling trips.

Many live/work units are provided at GMV to encourage residents to work from home, thus reducing the number of commute



trips. Several more live/work units are planned as part of Phases 3 and 4. Overall it was found that 7% of GMV residents work from home. This is similar to the proportion for Greenwich (7%) and slightly lower than for Inner London (9%), Outer London (9%), and London (9%) (Rutherford's 2005).

The results of this analysis show that the policy and design measures applied in GMV appear to have had a strong influence on reducing car trips made by residents, however potential remains to increase cycling trips, particularly within the development.

LESSONS LEARNED

While GMV residents drive less than their neighbors due to strong policy and design measures, overall car ownership remains higher than some of the other communities we reviewed. This is due in part to the location of GMV, far from central London, which demonstrates the importance of locating new development as close as possible to existing development.

The good news is, GMV's good public transit access, combined with the existence of London's congestion fee, have resulted in an impressive commute mode share of 79% by public transit.

Yet the travel choices of residents within the GMV development could still be improved. About half of residents travel by car for their weekly grocery shopping trip. Increasing the number and diversity of stores located at GMV could encourage more walking and cycling trips within the development as opposed to driving. Eight percent of residents already have groceries delivered; stores could further promote this service to encourage shoppers to leave their cars at home. It is important to ensure that these deliveries are made using sustainable transportation practices.

GMV also provides live/work units. However, at the time of the survey in 2005, the presence of these units did not seem to increase the proportion of residents working from home above that of the surrounding area. Promotion of these units and addition of units in Phases 3 and 4 may encourage more residents to work from home. Home offices have the obvious benefit of reducing commute trips. However, some studies have shown an increase in other trips due to the increased flexibility of the work schedule. This is another reason why it is essential to provide amenities within walking distance of residences in order to encourage residents to walk and cycle for their daily needs rather than traveling outside the development by car to access goods and services. ■

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Image credits

Figure 1: <http://maps.google.de/maps/ms?hl=en&ie=UTF8&vps=3&jsv=298d&oe=UTF8&msa=0&msid=116478322990710211544.000491ed99cace2d3ecac>

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Photos 3, 4: Frederique Siegel, ITDP Europe