

GIZ - Sustainable Transport in China

德国国际合作机构-中国的可持续性交通

Sustainable Urban Freight and Logistics

Challenges, Strategic Plan and Best Practices

可持续的城市货运和物流发展的挑战、实际解决方案和战略计划



Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

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GIZ – facts, figures and stories
德国国际合作机构-事实、数据与故事

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我们在可持续发展和国际教育领域提供服务.....



We support the German Government in achieving its objectives in the field of **international cooperation for sustainable development**
我们协助德国政府实现其在可持续发展的国际合作领域的目标.



We promote **international education work and human capacity development**.
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The areas we work in are extremely diverse

我们的服务多样化



Displacement and migration
位移与迁移



Environment and climate
环境和气候



Rural development
乡村发展



Sustainable infrastructure
可持续性基础建设



Social development
社会发展



Economic development and
employment
经济发展和就业

Security, reconstruction and
peace
安全，重建与和平

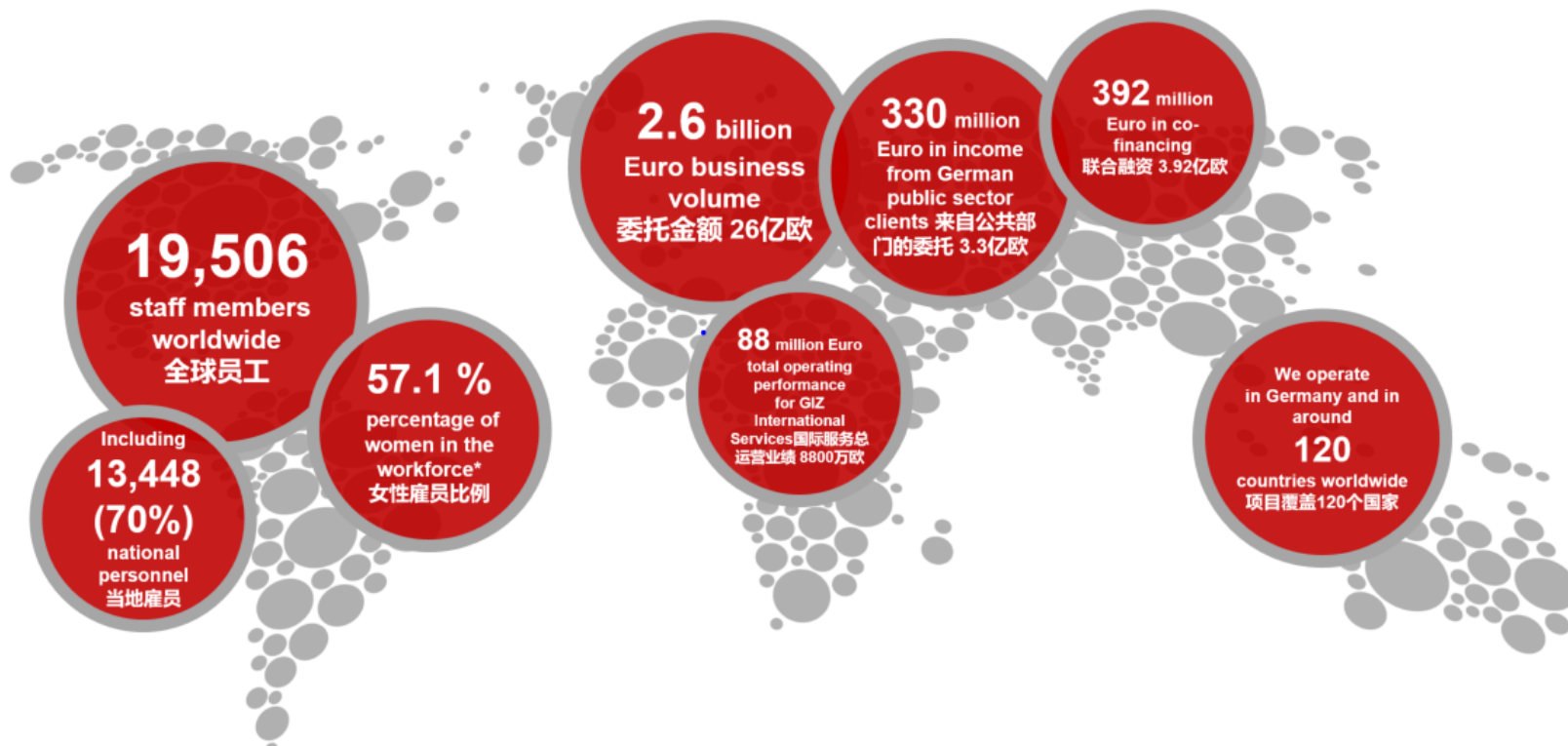


Governance and
democracy
治理与民主



Selected business statistics (2017)

2017年业务数据





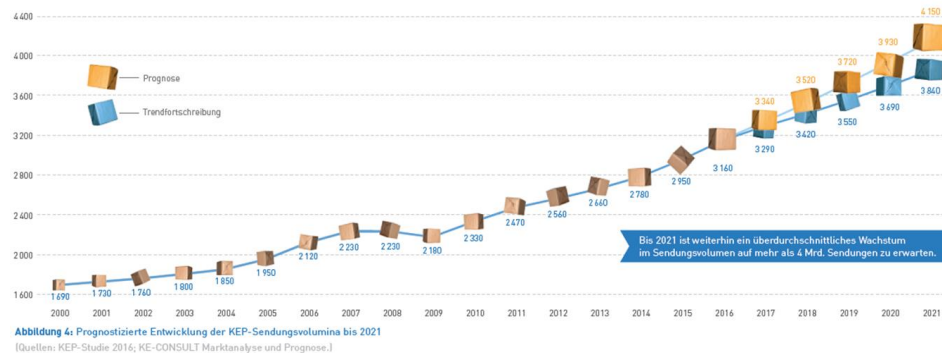
Urban Freight and Logistics Development and Challenges

城市货运和物流发展和挑战

The urban delivery sector in Germany is growing

飞速增长的快递行业

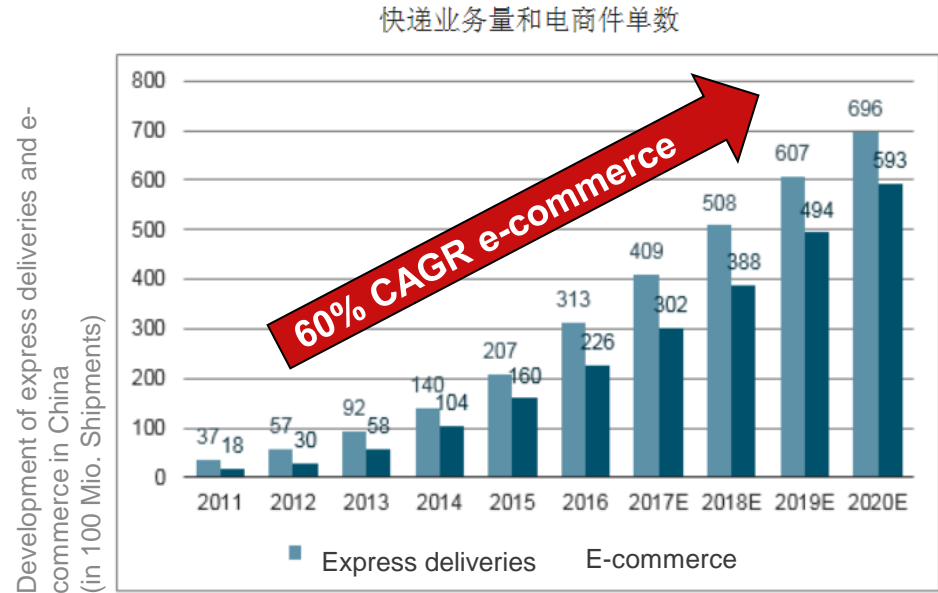
- In 2015, 2.95 billion parcels were shipped in Germany, an increase of around 6% compared to the previous year.
2015年，德国共运送包裹29.5亿件，同比增长6%左右。
- From 2015 to 2016 the increase was even higher, reaching +7.2% or 3.16 billion parcels.
2015年至2016年，这一增幅甚至更高，达到+7.2%，即31.6亿件。
- Until 2020, the number of annual parcel shipment is expected to reach between 3.69 and 3.93 billion.
到2020年，年包裹发货量预计将达到369亿至39.3亿件。



Express delivery and E-commerce continue to grow at fast pace in China

中国飞速增长的快递行业

- E-Commerce accounted for 72% of urban delivery in 2016
- 2016年电子商务占城市物流配送的72%
- 64% CAGR of E-Commerce and 44% of urban delivery between 2007~2016
- 2007~2016年电子商务的年复合增长率为64%，城市物流配送的年复合增长率为44%
- 60% CAGR of E-commerce shipments and 29% CAGR of Non E-Commerce shipments
- 电子商务配送量年复合增长率为60%，非电子商务配送量的年复合增长率为29%



Source: <http://www.chyxx.com/industry/201712/595031.html>

Express delivery and E-commerce continue to grow at fast pace in China

中国飞速增长的快递行业

- While in 2009 online sales in Germany (EUR 21 billion) and China (EUR 33 billion) were almost the same, the difference between both countries grew to around EUR 500 billion by 2017, which is equivalent to a 90% growth in China.
- 2009年德国网络销售额210亿欧元，中国网络销售额330亿欧元，两国网络销售额基本持平，但到2017年，两国网络销售额的差距扩大到5000亿欧元左右，相当于中国网络销售额增长了90%。
- By 2022, electronic commerce in China is expected to be greater than the total of the US, UK, Japan, Germany and France
- 到2022年，中国的电子商务预计将超过美国、英国、日本、德国和法国的总和



Source: 2017 (Quellen: <https://www.statista.com/graphic/1/460777/online-and-mail-order-retail-revenue-germany.jpg>, <http://www.estin.com/pdf/publications/E-tailing%20battlefieldVF.pdf>, http://cdn.static-economist.com/sites/default/files/imagecache/full-width/images/print-edition/20130323_FBC285.png)

Main players in the urban delivery market in Germany and China

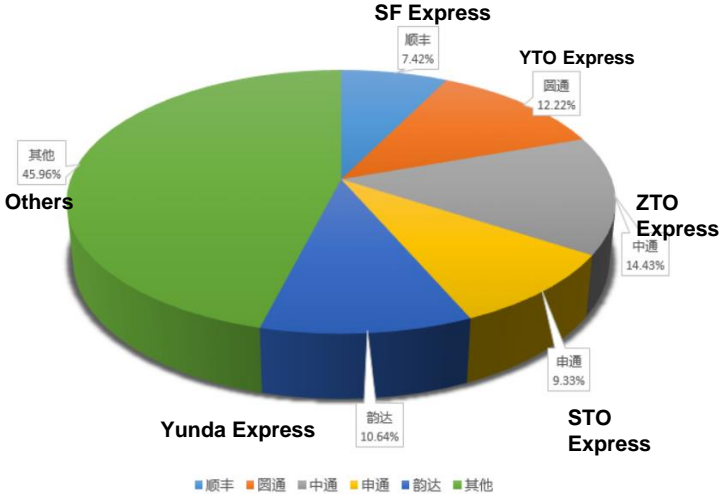
中德主要快递服务商

GERMANY: DHL is leading the urban delivery market in Germany



Abbildung 1: Marktanteile der Paketdienste in Deutschland im Jahr 2015 nach Anzahl transportierter Pakete!
 Den deutschen Paketmarkt teilen sich hauptsächlich DHL, DPD, Hermes, UPS, GLS, TNT und GO!²

CHINA: The urban logistics sector in China is divided among several players



Market share of express delivery service providers in China, in 2017

Source: http://www.sohu.com/a/197872620_617173



Sustainable Transportation System Development Policy Framework and Strategic Plan

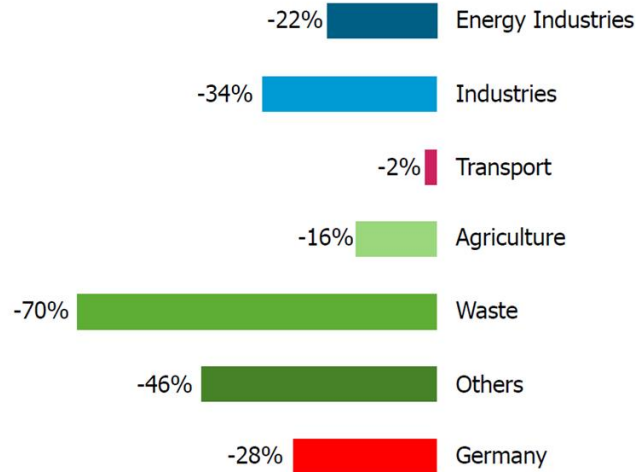
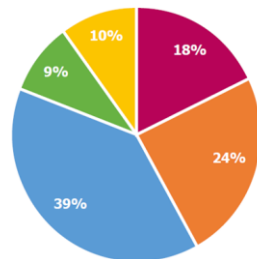
可持续化交通发展政策和战略规划

Transport sector has to be GHG-neutral 2050 in Germany

德国交通行业到2050年要实现近零排放

Development of GHG emission in Germany until 2050到2050年德国温室气体排放的发展

- The transport sector in Germany contributes with about 18 percent to the total GHG emissions
- 德国的交通运输行业的温室气体排放总量约占18%
- Compared to other sectors, almost no mitigation in the transport sector since 1990
- 与其他行业相比，自1990年以来，交通运输部门几乎没有任何减缓措施



Source: Umweltbundesamt

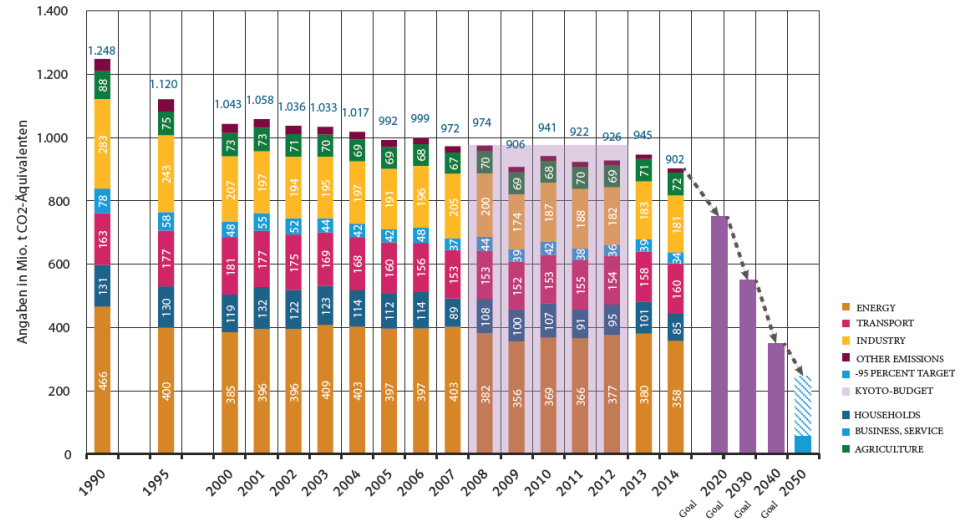
The German transport sector has to be GHG-neutral by 2050

德国交通行业到2050年要实现近零排放

Development of GHG emission in Germany until 2050

到2050年德国温室气体排放的发展

- The German Climate Action Plan 2050 foresees a mitigation of 55 percent until 2040 and 80-95 percent until 2050 (compared to 1990 levels) “2050年气候行动计划”预计到2030年将减少55%，到2050年减少95%（与1990年水平相比）
- GHG mitigation goals for the transport sector is 40-42% till 2030. 交通领域的减排目标为到2030年实现40-42%
- The German GHG emissions already peaked but transport is still a very critical sector regarding GHG mitigation 德国的温室气体排放已经达到顶峰，但交通运输仍然是温室气体减排的关键



Source: Umweltbundesamt

13th Five-Year Plan transport sector development in China

中国交通发展的第13个五年规划

Key targets for Transportation in China

中国交通的目标

- China's transport emissions are accounting for 10% of the total national GHG emissions
- China aims at developing a green and low carbon transportation sector
中国致力于发展绿色低碳交通体系
- Focus of the development of smart and intelligent transportation, New Energy Vehicles (NEVs) and alternative fuels
集中发展智能交通，新能源汽车和代用燃料
- Promotion of public and non-motorized transportation & micro-mobility
提倡公共和非机动交通以及微移动



High Speed Railway

Construction of a total length of 30,000 km, connecting more than 80% of all large cities



Expressways

Construction or upgrading of around 30,000 km of expressways



Civil Airports

Construction of at least 50 more civil airports



Urban Transportation

Approximately 3,000 km of new urban rail transit lines



City Cluster Transportation

Intercity rail networks for Beijing-Tianjin-Hebei, Yangtze Delta, Pearl River Delta, middle-reach Yantze, Central Plain, Chengdu-Chongqing region and Shandong Peninsula city clusters



Development of Corridors

Construction of cross border corridors and main corridors along One Belt One Road



Rural Transportation

Construction of 1 million km of rural roads to facilitate rural development; interlink all administrative villages via paved roads and shuttle bus services



Transportation Hubs

Construction of multimodal passenger and freight hubs and city complexes around transportation hubs



Intelligent Transportation

Internet based operation of transport infrastructure, internet of vehicles and vessels, vehicle automation



New Energy Vehicles

Cumulative total production and sales of 5 million new energy vehicles



Harbor and Shipping Facilities

Improvement of port clusters (Bohai sea rim, Yangtze and Pearl river delta) and inland waterways, specialized berths for containers, crude oil and Liquefied Natural Gas (LNG)



Cycling and Walking

Improvement of urban transport facilities for cyclists and pedestrians and promotion of cycling

*13th Five-Year Plan transport targets

The regulation is implemented and monitored by the State Council Postal Administration and the Provincial Postal Administrations among others.

Key measures:

- Establishment of a public rating system for express delivery agents, which may also include punitive measures (8);
- Use of reusable, recyclable or biodegradable packaging materials (9);
- Regulation of the express delivery vehicle fleets, in particular electric tricycles, with regard to maximum speed and loading weight; delivery vehicles will also be provided with parking space for loading and unloading (13).
- Cooperation of logistics service providers, e.g. in the joint use of logistics facilities to coordinate delivery in residential areas (14);
- Establishment of import-export express centers for cross-border delivery in order to accelerate the processing through improved cooperation with the relevant state institutions (e. g. import-export inspection, quarantine, customs) (15);
- Obligation for logistics service providers to deliver consignments during public holidays (23) and to protect the consignments from loss and damage (27);
- Logistics service providers are required to ensure that no illegal content is included in the shipments (31, 32)

Cities globally and in China are responding to growth of urban delivery

为应对城市配送的快速增长，全球城市纷纷采取相关措施

- However, current policies and measures are not sufficient to deal with further growth of delivery transport volumes in urban areas – regulatory and policy frameworks are still often focused on “traditional” freight sector demands and conditions
- 现有的措施主要针对货车，无法应对城市配送的快速增长



Weight restrictions
限重



Time restrictions
限时



NEV subsidies
新能源汽车的补贴



Loading zones
指定装/卸货区域



Best Practices for Sustainable Urban Freight and Logistics

可持续化城市货运与物流的创新实践

NEWS September 17, 2018: City of Frankfurt launches

„Logistiktram“ pilot

2018年9月17号——新闻报道：德国法兰克福启动“货运有轨电车”示范项目

- “To relieve the environment and inner city traffic, trams and cargo bikes carry out urban deliveries. If successful, they may even replace conventional delivery vans.”

“为减少货物运输对环境与市内交通的影响，法兰克福采用有轨电车与货运自行车进行城市配送。如果项目成功，则有轨电车与货运自行车将替代一部分城市配送厢式货车。”

Pilotprojekt der Frankfurter Straßenbahn **Pakete statt Pendler**

Entlastung von Umwelt und Innenstadtverkehr: In Frankfurt sollen Pakete künftig per Tram und Fahrradkurier an Haushalte geliefert werden. Bewährt sich das System, könnte es bald normale Transporter ablösen.



Montag, 17.09.2018 21:27 Uhr

Drucken Nutzungsrechte Feedback Kommentieren

CarGoTram Dresden – using a tram to supply the Volkswagen manufacturing plant

CarGoTram 德国德累斯顿—有轨电车供应大众工厂

The Concept 概况

- used to deliver car components from VW logistics center to factory
将汽车配件从大众物流中心运送到工厂
- passes through inner city of Dresden
有轨电车经过德累斯顿市中心
- Runs every hour on same tracks as passenger tram at max 50 km/h
每小时一班使用客运轨道的线路最高时速50公里/小时
- Operated by private operator on public tracks
私营公司在公共轨道上运营
- Cost per new vehicle: EUR 3.76m
电车成本：376万欧元/辆
- Replaces 3 HDTs
可替代3辆重型货车

Enabling factors 成功因素

- Restrictions for heavy duty trucks in the inner city of Dresden
重型货车无法进入德累斯顿市中心之内
- Strong support from city government
地方政府的积极支持
- High reputation factory („Gläserne Manufaktur“) of Volkswagen
大众工厂（也叫“玻璃工厂”）希望打造良好形象



Tram



Heavy
duty



Daytime



2000-
now



New

City Cargo Amsterdam (Netherlands) – one tram for four trucks

城市货运荷兰阿姆斯特丹—1辆有轨电车替代4辆货车

The Concept 概况

- Delivery of merchandise for small shops from peripheral „cross-docks“ to inner city hubs
将商品从市中心之外的转运站运送到市内小型枢纽
- Operating on existing infrastructure 在现有轨道上运营
- Design of special delivery vehicle (re-use of old tram)
将旧的旅客有轨电车改造为专用货运车厢
- Operated at same time as passenger transport
与旅客共线运输
- Public operator, public and private funding
公共部门运营，公共及私营部门共同出资
- Completed two test phases
两个测试期已经结束

Enabling factors 成功因素

- Strong support from city government
政府的有力支持
- Government wants to be innovation leader
政府希望成为创新的领袖



Tram



Light
duty



Daytime



2007-
2009



Recycled

Innovative technologies drive urban delivery into new stage

创新技术引领城市物流进入新时代

Autonomous Light Commercial Vehicles (LCVs) 自动驾驶汽车

The Concept 概况

- DHL is working on own fleet of self-driving vans
DHL在自有货车队应用自动驾驶技术
- 2019: first autonomous vehicles pilot project
2019年: 首次进行无人车辆示范项目
- Extending several StreetScooter e-vans with sensors and cameras
准备改造数辆StreetScooter电动货车, 加传感器和监视器
- Vans supposed to park autonomously in the future
未来货车可以实现自动停车

Enabling factors 成功因素

- Enormous efficiency potential in supply logistics and last mile delivery
具有巨大提升供应链及最后一公里配送效率的潜力
- Can move goods regardless of daytime and driver availability
送货不受时间和驾驶员的限制
- Can contribute to reduction of traffic congestion
有利于减少交通拥堵
- Vehicle-to-vehicle communication: set high speeds and avoid busy routes
车辆通信, 允许更高时速避免拥堵路线
- Significantly reduce noise and exhaust emissions
可以大幅降低噪声与排放



Innovative technologies drive urban delivery into new stage

创新技术引领城市物流进入新时代

Cargo Drones 无人驾驶飞机

The Concept 概况

- DHL has been testing drones („Paketkopter“) since 2013
2013年起，DHL测试着货运无人机 (“Paketkopter“)
- Drones have been used to supply island of Juist with medical supplies
在德国的Juist岛，货运无人机已应用于派送药品
- Paketkopter has been successful piloted parcel delivery in June 2019 in China
2019年6月在中国无人机已经成功测试于快件配送
- DHL has developed special parcel locker for DHL 研制特殊的寄物柜，作用在于
 - Storing drone存放
 - Charging drone无人机充电
 - Loading drone with parcel载货

Enabling factors 成功因素

- Unmanned aerial vehicles
无人空间运输工具
- Payload around 2-3 kgs
载货量为2~3公斤
- Speed up to 70 km/h
速度在70公里时以内
- Flying autonomous or within „line of sight“
自动驾驶或视线内飞行
- Winged aircrafts or multi-copters
有翼或直升机
- Discharge payload through parachute or by landing on site空投或落地卸货
- Particularly useful for high-urgency, high value cargo
特别适用于紧急或高值的货物



Innovative technologies drive urban delivery into new stage

创新技术引领城市物流进入新时代

Autonomous ground vehicle (AGV) lockers 自动驾驶移动储物柜

The Concept 概况

- Germany Media Markt tests SMILE together with manufacturer Starhip
德国Media Markt和Starhip生产企业测试SMILE送货机器人
- Vehicles not allowed to drive on sidewalk
人行道上不允许开车辆
- Other vehicles require special permission
其他车辆需要特殊的许可证

Enabling factors 成功因素

- Different implementations possible:
不同备选条件:
- Autonomous mini-vans follow deliverers at walking pace
微型无人货车跟随步行的送货
- Autonomous ground robots in combination with logistic trucks
结合地面无人机与货车
- Customers open wheeled parcel lockers with a personal code
客户通过特定验证码打开轮式储物柜



Electrification as key to decarbonizing transport – not only in the heavy duty freight sector

电动化是交通领域减排的关键

- Technical innovation could reduce GHG emissions dramatically
新技术的应用可以帮助交通领域实现明显的减排效果
- But: remaining motorized transport is likely to be of significant volumes
但是交通量的存量依然巨大
- For road transport, electrification is a solution for emission mitigation, in both heavy duty freight and urban logistics transport
在道路运输中，应侧重电动化



By end of 2017, a total of 123,000 NEVs (12,000 NEVs in the logistics industry) and 10,700 charging points were operational in Germany

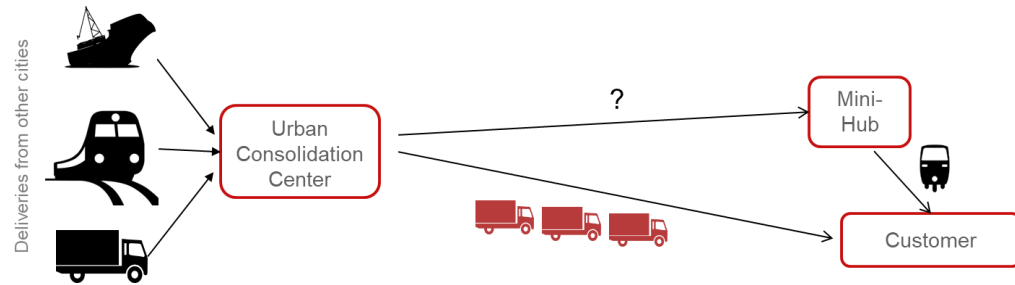
截止2017年年底，德国电动车保有量：12.3万辆，其中电动物流车1.2万辆，充电桩1.07万个

Intermodal urban freight transport solutions can improve operational efficiency and can reduce GHG emissions

利用干线货运：城市货运多式联运有助于提高效率并降低排放

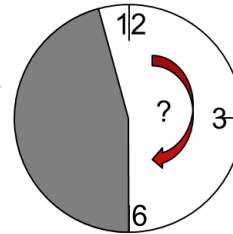
Intermodal urban freight transport helps to efficiently and systematically integrate multiple modes of transport, to:
多式联运有助于融合多种运输方式，从而：

- Lower energy consumption and emissions
降低排放
- Increase operational efficiency
提高效率
- Lower costs
降低成本
- Lower load factor of road infrastructure
降低道路基础设施占用



本站首末车时间 First/Last Train from This Station			
10号线 往农业展览馆 往三元桥 To Agricultural Exhibition Center To SANYUANQIAO			
首车 First Train	05:25	05:50	
末车 Last Train	全程 21:17 终点巴沟 23:03 终点成寿寺 23:27	全程 22:03 终点车渠沟 23:48	

About 6 hours of no public transport service



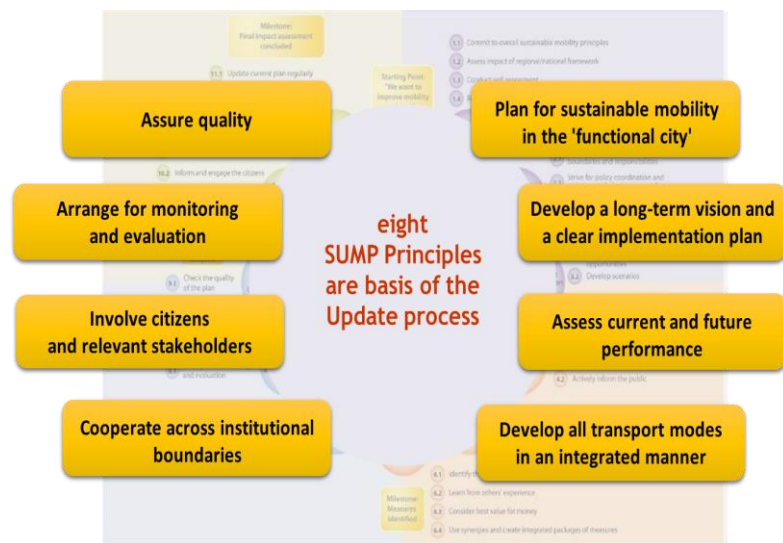
- Maintenance
- Cleaning
- Transport of cargo?

Sustainable Urban Mobility/Logistics Planning SUMP and SULP

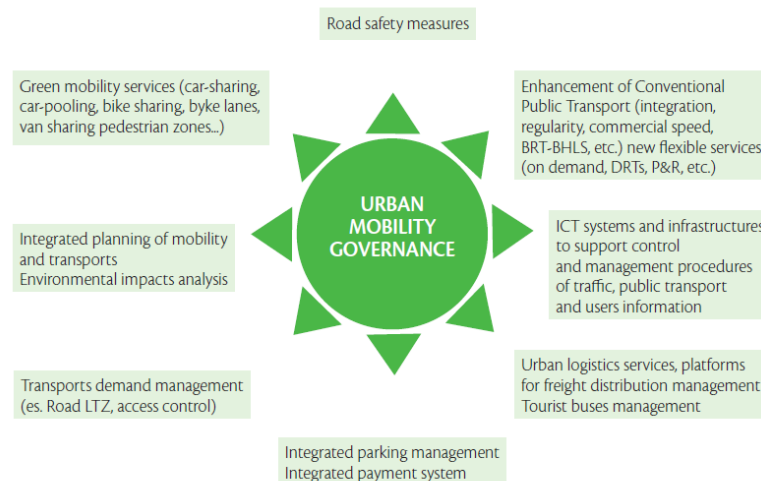
可持续化城市、物流发展规划

SUMP/SULP are integrated, strategic, long-term transport plan with clear goals and monitoring, for better accessibility, and quality of life for the functional urban area.

有着明确目标和监测机制，是综合的，具有战略性的长期交通运输规划，使功能性城市区域交通更便利，提高该区域生活品质



Mobility Governance: services and measure



Decarbonizing Transport - A joint challenge for China and Germany

交通运输的脱碳化- 中德共同挑战



Images: City of Ghent

Ghent, Belgium

Thank you for your attention!

Ding Yan 丁妍
Project Manager 项目经理

Sino-German Cooperation on Low Carbon Transport
中德低碳交通合作项目

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
德国国际合作机构

Contact: yan.ding@giz.de

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