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Electrification of Bus and Taxi Fleet The Shenzhen Bus Group Experience

深圳巴士集团 大巴、出租车全面电动化经验分享

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Shenzhen SEZ Since 80'

深圳经济特区发展



Shenzhen SEZ Since 80'

深圳经济特区发展



Shenzhen SEZ Present 深圳经济特区现状

Population 人口: 13 Million 13

亿
Area 面积: 1990 km²

GDP: \$350 Billion 3500亿美

元
Ranked 1st in Business Environment In China 被评为中国营商环境第一城市

Colleges & Universities 高校:

18
Transportation : 1 Airport 机场

9 Passenger/Freight Ports 客/货运码头

6 Train Stations 火车站

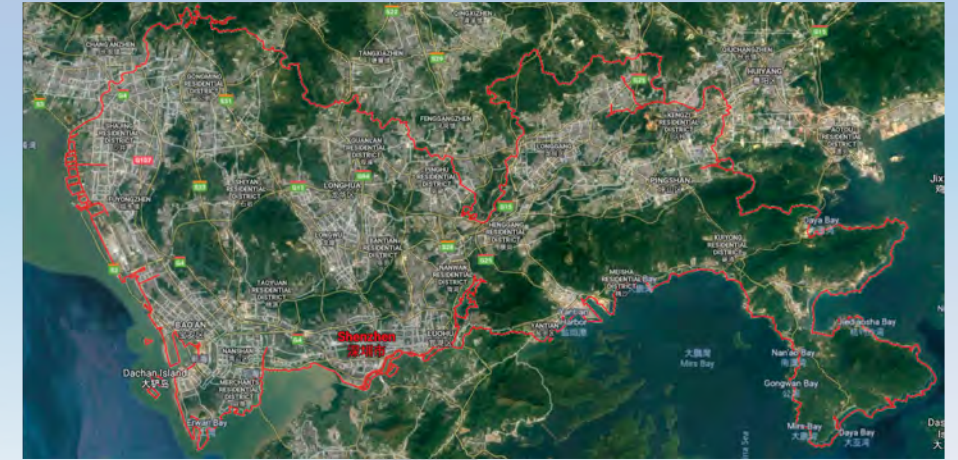
7 Boarder Check Points 口岸 (Only city in China with Sea, Air and Land checkpoints)

(国内唯一一个同时具有海陆空口岸的城市)

8 Metro Lines 地铁线路

977 Bus Routes w/ over 10k Buses 大巴线路

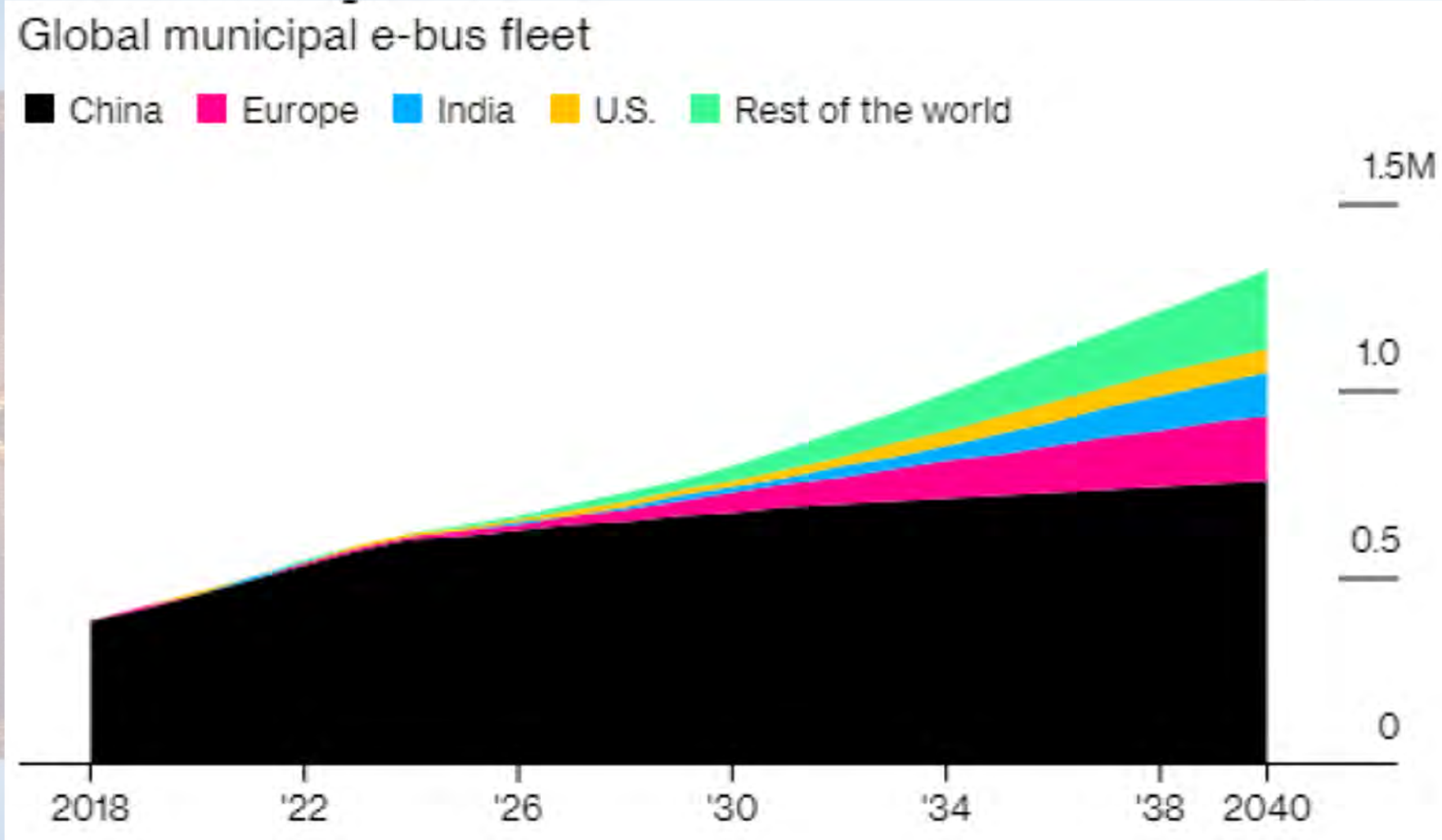
20K Taxis 2万台出租车



Shenzhen City Limit
深圳市

About Electric Buses

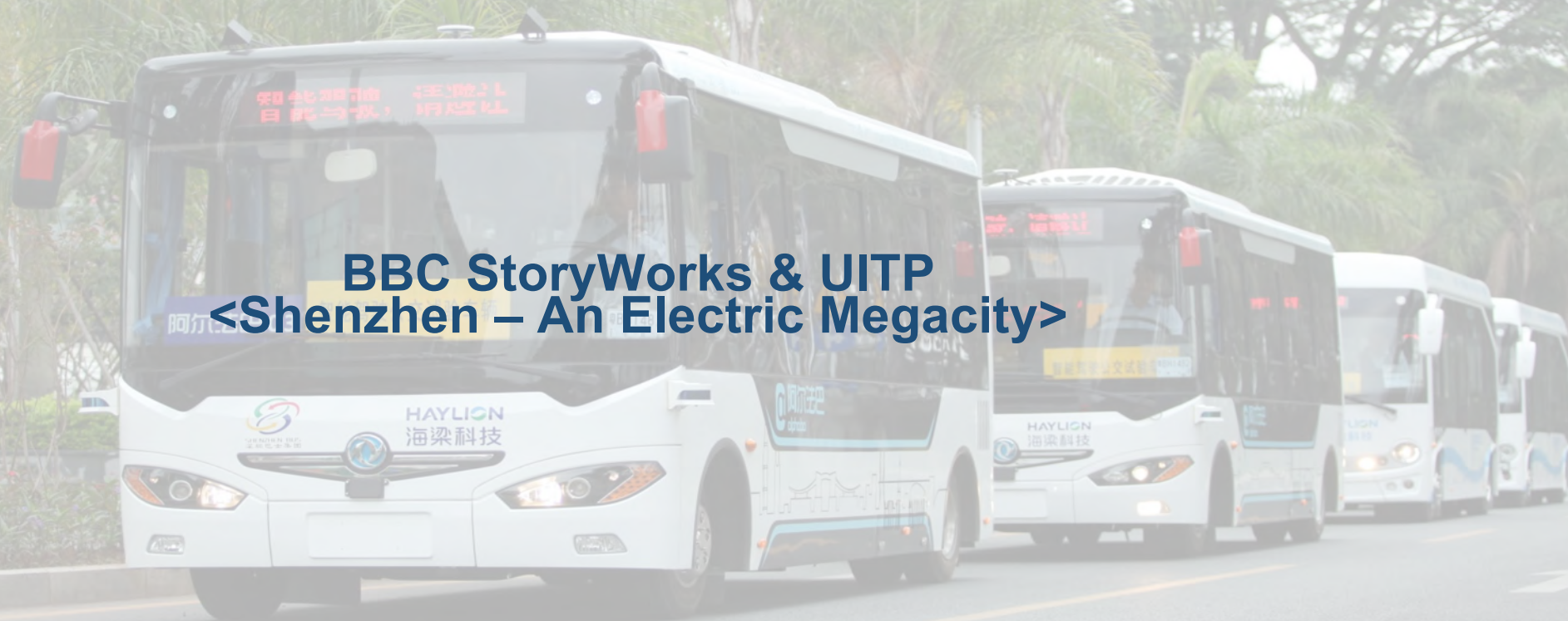
电动大巴发展情况



Source: BloombergNEF's "Electric Vehicle Outlook 2019"

About SZBG

关于深圳巴士集团



BBC StoryWorks & UITP
<Shenzhen – An Electric Megacity>

About SZBG

关于深圳巴士集团

Largest new energy public transportation operator in the world 全球最大的新能源公交运营企业



Taxi 出租车



Urban Bus 城镇公交



Custom Bus 定制公交



Micro Bus 微巴



School Bus 校车



Tour Bus 旅游巴士



Cross-border Bus
跨境大巴



Cross-border Truck
跨境火车



Vehicle-rental 汽车
租赁



About SZBG 关于深圳巴士集团

Company Assets 公司资产

Staff 员工 : 28,000



Fleet Size 车辆 : 12,275 台



Annual passenger capacity 年客运量:
800,000,000 person-times 人次



Urban buses 大巴 : 6053 Taxis 出租车 : 5549
Cross-border, ondemand and tour vehicles 其他 : 673

Charging stations 充电站 : 101



Depots 充电桩: 1,018,000 sq.m



Shenzhen Tong
Shenzhen All-purpose Card 深圳通



Chargers: 1,717

Self-owned station area 自由场站: 310,000 m²
Rented station area 租赁场站: 708,000 m²

40 million cards 发行4千万张
12 million active users 1200万活跃用户
annual transaction amount of RMB 6 billion
年交易额约6百万人民币

Process of Electrification

全面电动化

BUS

In May 08 - 10 hybrid buses

2008年5月：10台混动大巴。

In July 11 - 137 electric buses.

2011年7月：137台纯电大巴

In June 17 - 6053 buses became electric buses

2017年6月：6053台出纯电大巴，全面电动化。



TAXI

In May 10 - 50 electric taxis.

2010年10月：50台电动出租车

In Dec. 17 - 3,056 electric taxis.

2017年12月：3,056台出租车

In Dec. 18 - Shenzhen taxi electrified.

2018年12月：深圳出租车全面电动化



CHARGING

In June 10 - first charging station.

2010年10月：首个充电站完成建设

In Apr. 16 - "grid-type fast charging" technology.

2016年4月：网格化快充技术

In Dec. 18 - 333 chargers for taxis.

2018年12月：完成333个出租车充电桩建设



Benefits of Electric Buses

电动大巴的优势



Technical Standardisation of Electric Buses

技术标准

Minimal
vehicle maneuvering
最小化车辆移动

Full use of trough
period electricity 最
大化谷期充电时间



Flexible charging 弹
性充电

- 10.5-metre buses 10.5米大巴
- DC fast charging 直流快充
- Patented grid chargers 网格化充电
(专利)

One charger/
4 buses 单个充电桩
最多充4台车

Land efficiency 提高
土地利用效率

Technical Standardisation of Electric Buses

技术标准

Intelligent Dispatch Centre
智能调度中心



E-bus maintenance 电动大巴维保



Charging service 充电服务



Electric Taxis

电动出租车

- SZBG owns 2 taxi companies 深圳巴士集团拥有2家出租车公司
- 6,050 taxis 6,050台出租车
- 21.3% of the total taxis (22,000) in the city 占市内出租车总量（22,000台）的21.3%
- Taxi chargers: 333 333个出租车充电站



Pengcheng Electric Taxi 鹏程电动

- First pure electric taxi company in the world 世界首家纯电出租车运营企业
- Current Chair Unit of UITP UITP出租车分会主席单位
- Management model for pure electric taxi business combining OEM and operator 制造商、运营商结合的纯电出租车运营管理模式
- Global media and commercial interest – visits by Hillary Clinton and Warren Buffett. 环球媒体关注（希拉里及巴菲特到访）



Comprehensive Charging Stations 多功能充电场站

One-stop stations to serve the passengers, drivers and taxis 一站式乘客、驾驶员、车辆服务场站



For consumer 对乘客：

- Convenience services 便捷搭乘
- Other onboard services 提供增值服务
- Discover other needs 发现乘客需求



For driver 对驾驶员：

- One-stop taxi fleet 基本出租车场站功能
- Driver dining service 驾驶员就餐
- Driver life leisure 提供驾驶员生活服务



For taxis 对车辆：

- Charging service 充电
- Maintenance services 维保
- Power storage 储能



On-Demand Bus

优点巴士

Start time 开始时间: 2016

Line 线路总数: 1650

App- based Customer/Commuters

基于APP的乘客服务

Service mode 服务模式 : Fixed
route, fixed time (peak hour) ,
Fixed fare 固定线路、固定时间（上
线班高峰期）、固定费用

40 Seats / bus 每台大巴提供40个
座位



On-Demand Bus

优点巴士

7

Cities
7个城市

70%

Attendance
rate
70%上座率

500K

Registered
users
50万用户

1650

Lines
1650线路

1602

Passengers
per 1000
km
百公里乘客
数1602人

50K

Active users
per day
5万日均用户

U+ Minibus

优+小巴



Shekou Shenzhen & Shangli Pingxiang

在深圳蛇口、上栗萍乡运营

10 Seats 10座小巴

Running time: Off peak 非高峰期运营

Dynamic route 动态线路

No fixed Route 非固定线路

No fixed schedule 非固定时间

U+ Minibus

优+小巴



Shekou Shenzhen

Area	3 km × 3 km
Vehicles	5 (10 seats)
Operating time	7 a.m. – 10 p.m.
Max orders/day	284
Max passengers/day	335
Waiting time (avg.)	5.23 min
Detour ratio (avg.)	1.26



Shangli Pingxiang

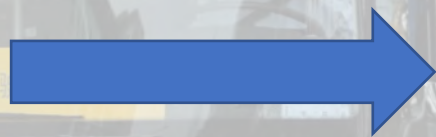
Area	3 km × 5 km
Vehicles	5 (10 seats)
Operating time	7 a.m. – 7 p.m.
Max orders/day	305
Max passengers/day	361
Waiting time (avg.)	6.20 min
Detour ratio (avg.)	1.31

Autonomous Driving Technologies

无人驾驶



SHENZHEN BUS



HAYLION 海梁科技
Technologies



An Autonomous Driving Bus Trails that Operated over 20,000km without Incidents under Harsh Weather Conditions

无人驾驶测试已运行超过2万公里（包括极端气候条件），期间未发生事故



Thank You!
谢谢！