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铁路中心的电缆布线
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Machines to cut stable tunnels

现场热再生技术削减成本
Hot-in-place asphalt cuts costs

“伽利略”进入轨道
Galileo goes into orbit

公路交通判断
TrafficSense on the streets

A new seat is born
路标技术
Road & Rail Technology

（经济导报）技术系列特刊，为读者提供全球行业信息及技术发展资讯。
特别分析了不同行业领域，共筑世界的知识和智慧。

特此EIA百问杂志，支持Cavendish in China，给予读者信息于全球工业和科技发展。

Special issues analyse different industry sectors, sharing knowledge and expertise from around the world.

公路堵塞情况日益严重，为此我们绞尽脑汁寻求解决方案，包括从拥挤收费到定量分配等等。尤其定量收费，可以说这是一种最为严谨的解决方法，解决方法是最好地使用系统，维护交通驾驶人的选择权，同时确保交通能够得到有效管理和服务，以达到最佳的交通状况。

这种交通系统的重要性在于智能交通系统世界大会上得到了许多与会代表的肯定。这次大会是有关智能交通系统的世界大会，于2007年10月9日至13日在北京举行，共有46个国家和183家公司约2,000名专家出席此次大会，这些专家的研究代表了交通系统中最新发展情况和管理技术，同时与会人员还包括来自亚太地区的约4万名来宾。

目前市场上有两种基本系统。第一种是采用摄像机和计算机监控的交通流量，第二种是汽车本身为中心，通过全球定位系统（GPS）和全球移动通信系统（GSM）进行工作。欧洲伽利略卫星群在未来10年内不会投入使用，那么采用第二种系统的趋势将大；目前已经有了一枚卫星并进入了轨道，通过它的原子钟来提供准确的时间。

同时，市场上交通管理系统的产品越来越丰富，包括收费方案以及测量车辆必经的方案。交通管理系统在市区的挑战最大，由于来自建筑物、桥梁、天桥和建筑物的信号会受到反射，再加上多路径和其他干扰，所以使市区的交通环境条件变得极为不利。

在这些方面中介绍的是Satellite公司提供的一种解决方案，这可以针对二氧化碳排放来实现公路收费，这是一种很先进的理念，另一种解决方案是建设浮动车辆系统（CDFD），它能够实现准确的行驶时间，在测量本地速度和检测行驶时有着类似于公路收费的性能。

具有竞争力的技术将会变得日趋成熟，最终有一天这种技术能够与国与国之间，甚至城市与城市之间形成一种标准化。虽然这依然还没有到来，但是交通系统并并有序的时代已经为时不远。

In the last issue of RRT, we mistakenly included information on the Interratraffic China Show from 2007. Of course, the intention was in fact to publish information regarding the 9-13 October Interratraffic 2007. We apologise for this error.

如果您有任何意见、批评或建议给我们写信，请将电子邮件发送至dy@cavendishgroup.cn

Email comments, criticism or letters to: dy@cavendishgroup.cn
The environmental challenge
Mobility of the future will use intelligent transport systems to be safe, secure, energy efficient and environmentally sustainable

Environment and sustainability
8 The environmental challenge
Mobility must be safe, secure, energy efficient and environmentally sustainable

Event preview
13 Headlining conference will unite host cities
The Boao Forum for Asia International Capital Conference – London will attract the highest level of delegates from China and the UK

Focus on ITS
15 Accurate data collection in real-time
New cellular based technology affords a 95 per cent cost reduction for metro wide traffic data collection

19 Galileo takes up orbit
Satellite constellation will pinpoint locations within a distance of 1m

24 Satellite positioning for toll charging
Satelite Traffic Management GmbH presents German technology that uses satellite positioning to control toll charging and monitor CO2 emissions

28 The information highway
Information systems are in place, but are they being used to their full potential?

31 City development
Siemens and Newcom link ITS capabilities

33 Roman expertise for clean air
Infomobility service being developed for Beijing

34 Hi-tech hotline keeps Hong Kong moving
New system determines optimum routes for bus passengers

Construction
36 Hot-in-place asphalt cuts costs
Recycling of asphalt produces nearly new and durable pavements

41 Compressed air key to metro work
Atlas Copco compressors are to supply air for the bentonite plant and high-pressure grouting in the construction of the Istanbul rail system

Tunnels
44 Cutting stable tunnels
Boring machines drive into rock at a rate of 18m a day and can now control the stability of new tunnels by monitoring the pressure in the cutterhead

49 Fire and smoke control
More research is needed to establish the most effective methods to ventilate tunnels and ensure the safety of road and rail passengers

53 Second bridge across Orinoco
A new multi-span cable-stayed structure strengthens transport and export links for Venezuela and Brazil

55 Reliable rail comms for tunnels
A secure wireless technology will provide uninterrupted communication between trains and signallers across the whole rail network

Train interiors
60 Versatile train seats
A new type of adjustable seat caters for a wide variety of passengers with different needs and tastes

64 Clearing the gangways
Optimising luggage space on trains can reduce queues, improve safety and speed up operations

Switches
73 Superior magnetic sensors
Innovative rotary speed sensors for rail vehicles have integrated bearings and are more flexible and robust than previous sensors

83 Busbars tested to extremes
RO-LINK Performance busbars in traction systems can handle several thousands of volts

Rail
86 Era-transceiver connects trains
System opens up multiple communications potential

92 Cables at core of railways
New secure cables can operate in temperatures up to 140°C and lead the way towards the European goal of interoperability using a single communications platform

97 Automated welder closes large gaps
The new electric flash butt welder has a completely automatic weld cycle and produces a weld in less than 180 seconds

99 Sanding system reduces pollution
A new sanding system is fully electronic and reduces fine dust pollution from streetcars

102 Heating switch points
The safe operation of switchpoints during bad weather relies on effective heating systems

Rolling stock
109 Reliable power for railcars
Sophisticated engines deliver constant torque over a wide range of speeds and have a wide variety of applications

Motorway
111 Dimming motorway lights
New technology allows roadside lights to be controlled electronically and dimmed in quiet periods
Clearing the gangways

Optimising luggage space on trains can reduce queues, improve safety and speed up operations.

In order to operate long distance rail travel efficiently, attempts are often made to increase the number of seats in train carriages. The consequence, however, of maximising the number of seats is that only the overhead racks are available for luggage storage.

An extensive study at the Institute for Railway Engineering at the TU-Wien, which was carried out on long distance trains...
Metzeler Schaum GmbH — 德国总部

Metzeler Schaum GmbH是一家总部位于德国Memmingen（慕尼黑附近）的公司。

Metzeler是一家欧洲一流的泡沫材料生产商，它拥有近400名技术专家，并且是全世界铁路工业高质量泡沫材料的主要供应商。

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When people are boarding the train, queues form even more quickly if it is difficult for passengers to find free seats and suitable areas to put their luggage.
列车内部装饰
Train interiors

行李堆放地板上还堵住了各种紧急出口，若有危险发生，将给安全带来巨大风险。紧急出口又进一步受到过窄的过道的限制。车厢两端的车门布置有相同的问题，因为紧急出口对坐在车厢中间的旅客来说距离很远。

列车断点
上述这些情况容易导致旅客在上列车时排队，特别是当旅客发现很难找到空座位和适合的地方放行李时，排队更容易发生。

列车内部设计不合理导致的排队会造成旅客在车厢和过道高峰段的换乘时间增加。高入口和低层也是排队增加的一个因素，火车会在每一个站台停靠几分钟，根据距离的远近，乘客可能需长时间等待。这会使前、后列车以及全天列车时刻安排造成巨大影响。

如果对车辆的调整加以关注，列车空间的有效利用将得到显著提高，这两个关键点关注于登上列车的旅客和总体座位安排。

潜在改进
新造列车应重新考虑车门的位置。如果两个出入口放在车厢四分之一处而不是在车厢两端的话，旅客可以更好的分流。这将明显减少旅客的排队现象，为了加快旅客上车速度，出入口的门宽度至少要达到90厘米。

同样重要的是从月台通往列车中间的台阶数目。根据旅客携带的行李。旅客跨越4级台阶所用的时间是跨越2级台阶的两到三倍。一名携带沉重箱子的旅客平均需要12秒跨越4级台阶，跨越2级台阶则平均需要8秒钟。

上车交叉坡度如果狭窄的话也可以减少换乘的时间。和一辆车门宽度为80厘米、台阶高度/深度比例为23:20厘米的R12机车车厢相比，登上一辆车门宽度为90厘米、台阶高度/深度比例为21:23厘米的内燃机车，旅客平均需要的时间减少了15%-20%。

为了避免排队，列车内部最靠近出入口的区域必须让旅客顺利上车和分流。因此，首先这个区域不能太狭窄，带行李的旅客完全70和80 per cent。In this way at least 20 per cent of the seats are unusable.

Inappropriately placed luggage blocks the flow of passengers and also causes a great deal of difficulty for the staff. A further problem ascertained by the study was that train aisles were too narrow. With a width of less than 60cm, passengers find it a great deal more difficult to carry their luggage.

Baggage placed on the floor can also block the various emergency exits, which represents a high risk to safety in cases of danger. The emergency exits are further restricted by aisles, which are too narrow. The usual layout of the doors at both ends of the carriage has a similarly problematic effect, since the emergency exits for people who sit in the middle of the wagon are a long way off.

Delayed trains
When people are boarding a train, these circumstances can easily lead to queues, which form even more quickly when it is difficult for passengers to find free seats and suitable areas to put their luggage.

Queues caused by badly designed train interiors lead to increased passenger changeover times at stations and at peak travelling times. High entrances and steps are also a factor in increased queues. The delay of a train increases a few minutes with every station. Depending on the distance, this can culminate in significant delays. This has knock-on effects on approaching and following trains and on the timetable arrangements for a whole day.

If attention is paid to the institute's investigation, a marked improvement in the effective utilisation of space on trains can be made. The two critical points concern passengers getting onto the train and the seating arrangements in general.

在一般车门位于车厢两端的普通列车内，行李架安排在车厢四分之三处、车厢的两侧，而为了优化使用率行李架应靠在一边
In normal trains with doors at both ends of the compartment, luggage racks are arranged in quarter points of the carriage, opposite each other.

To get optimum efficiency they should be placed next to each other.
Potential improvements

The position of the doors in newly built trains should be reconsidered. If the two entrances are put at the respective quarter points instead of at the end of the carriages, the flow of passengers can be better spread, which leads to a tangible reduction in passenger queues. In order to speed up passengers getting on, the entrance doors must have a minimum width of 90cm.

Of equal importance is the number of steps that lead from the platform to the interior of the train. Depending on the luggage that is being carried, it takes a passenger two to three times longer to negotiate four steps than it does to negotiate two. A passenger with a heavy case takes, on average, 12 seconds to negotiate four steps. The same passenger needs on average five seconds to negotiate two steps.

A gentler gradient of the steps leading onto a train also contributes to a reduction in the changeover times. When getting on to an ICE train with a door width of 90cm and a step ratio (height/depth) of 21:23cm, a passenger needs on average 15 to 20 per cent less time than when getting into a RIC carriage with a door width of 80cm and a ratio of 23:20cm.

In order to avoid queues, the immediate entrance area inside the train must fulfill the function of taking on and distributing

能在此短暂停留，而为了避免过多人限制旅客，另一要求是座位之间的宽度必须至少有60厘米。

在一般车门位于车厢两端的普通列车内，行李架在车厢的四分之一处、车厢的两侧，而为了优化使用率，行李架应靠在一边。后一种安排将保证上车旅客的快速流动，并因此减少排队现象。

座位的最大数量不应该根据运营方的意愿来设置，而应该以旅客在各种情况下的行为为基础。大多数旅客都带有行李，有时候行李会占据大量空间。这种现象在通往机场或度假圣地的列车上尤为明显。

案例研究

这里所引用的数据表明了旅客目的地的平均分布。12%为假日旅行，15%为长途私人旅行，38%为短途旅行，剩下的是为期一天到数天的商务旅行。

每名旅客平均携带0.8件行李，包括大、中型的旅行箱、旅行袋或背包。每名旅客另外携带0.7件手提行李，有小旅行箱、旅行袋和背包，大小类似于飞机上所允许携带的手提行李。

《Road & Rail Technology》
The maximum number of seats should not be set according to the wishes of the operator. The basis for the maximum number of seats should be set by passengers and their behaviour under various conditions.
In normal trains with doors at both ends of the compartment, the luggage racks are arranged in quarter points of the carriage opposite each other, whereas to get optimum efficiency they should be placed next to each other. The latter arrangement would guarantee the best possible flow of passengers getting on and in this way reduce the queues.

The maximum number of seats should not be set according to the wishes of the operator. The basis for the maximum number of seats should be set by passengers and their behaviour under various conditions. Most passengers have luggage with them, which sometimes takes up a lot of space. This is to be observed especially in trains which serve airports or holiday destinations.

Case study
The figures referred to here indicate the average distribution of passenger destinations. These are 12 per cent holiday journeys, 15 per cent longer private journeys, 38 per cent short journeys and the rest are business trips of one or several days.

Each traveller has on average 0.8 pieces of luggage. These are big or medium sized cases, travel bags or rucksacks. Each passenger has in addition 0.7 pieces of hand luggage. These are small cases, travel bags and rucksacks with a volume like the normal hand luggage allowed for air travel.

The area needed to deposit luggage will be demonstrated on a new, fictitiously chosen train. This is a second-class open saloon coach with some face-to-face seating and some seating in rows. The seat grid pattern is about 92 cm. Making full use of the seating arrangements, a maximum of 88 seats can be built in the compartment and in this case there is no space to deposit luggage near the floor, only overhead racks are available for depositing luggage.

If the actual behaviour of passengers is transferred to this train, then depending on the distribution of the destinations, 20 to 30 per cent of the seats are unusable, since they are blocked off by luggage. Even if all passengers were prepared

旅客不愿举高行李，而是宁愿忍受给自己以及
其他旅客带来的不便之处

Travellers would like to avoid having to lift their luggage and so are prepared to put up with discomfort for other passengers as well as themselves, in order to avoid lifting luggage.
耐克森电缆，机车安全运行的保障

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to lift their luggage and stow it in the overhead racks, there would not be enough luggage space on days with an increased number of holidaymakers. Since there are many passengers who are not prepared and often not in the position to lift up their heavy luggage, then only the light pieces of luggage and clothing are lifted up and the heavy luggage stays on the floor, or on or in front of the seat.

Accordingly, in this compartment only 70 of the 88 seats would be available. During holiday periods there would be even fewer.

If six seats were removed to create space for three luggage racks, 82 seats could be installed, but of these only a maximum of 77 could be used. Accordingly, there would be seven more seats, but in actual fact there would be 6 fewer available. The upper limit for seats, in order to get around 100 per cent efficiency, is around 80 in this type of carriage on an average travel day. In this case four luggage racks can be built and on the basis of the analysis of passenger behaviour, a possible seating efficiency of 100 per cent can be predicted.

Thus, by giving up eight of the 88 seats in theory, there will be 10 more available seats in practice. This increases not only the efficiency, and with this the economy, but also passenger comfort and customer satisfaction.

The final choice of number and size of luggage racks depends on the factors including the train’s destinations. As a general rule the installation of four luggage racks each with an inside width of at least 100 cm has proven to be most advantageous. The bottom rack, which is mainly meant for large and heavy pieces of luggage, is at least 75 cm height. Above this are two racks arranged with an interior height of 55 cm and 45 cm, and here the smaller upper rack is suitable for travel bags and rucksacks. When building the racks care must be taken to have them sloping backwards so that the luggage does not fall down.

Another opportunity for luggage storage is the space that is left between the two back rests of seats. Such storage is popular with passengers as they are able to watch their luggage. When designing the carriage, the headrests of the seats should not be next to each other, because the space left is much too small and therefore unusable. The seating arrangement is only efficient if there is space left, measuring from the floor, to a height of 60 m and a width of 35 cm.

When the interior of a carriage is being planned, it is a benchmark that 10 per cent of the maximum possible number of seats must be replaced by luggage racks in order to get about 100 per cent seating efficiency.

This article was contributed by Bernhard Rüger, TU-Wien