

TSUG

Transport Statistics Users Group

Monthly Review: January 2018

TSUG Committee expresses their best wishes to all TSUG Members and TSUG Newsletter Readers Happy and Prosperous New Year 2018!

This month's review has shown that Microtransit bus services have the potential to increase urban mobility in San Francisco, Boston and New York. Between June 2016 and June 2017, there has been a significant decrease in foreign visitors to the USA. In Chicago, from 2015 to 2016, CTA rail ridership has increased whereas bus ridership has decreased. In Virginia from September 2016 to September 2017, train ridership has increased. DB Regio hopes to cut diesel consumption by 10% by equipping rail vehicles with telematics systems. In the UK, rail passenger journeys have more than doubled in the last 20 years. In France, rail's market share has fallen by 0.5% per year since 2011. From 11 December 2016 to 11 December 2017, with the opening of the Gotthard Base Tunnel, the world's longest rail tunnel, passenger and freight traffic on the route has increased significantly. The busiest domestic air route is Jeju-Seoul Gimpo and the busiest international route Hong Kong -Taipei. Over the past three years, there has been significant growth in Middle East air connections with the growth of Emirates, Etihad and Qatar Airlines. Global RPKs rose by 7.2% year-on-year in October. Hacking is becoming a booming means of transport in Baltimore's African-American community. Introduction of roundabouts in Minnesota has shown reductions in serious injuries and has been saving lives. Compared with the year ending September 2016, total motor vehicle in UK was up by 1% at 325.5bn vehicle-miles. Florida's Interstate 4 has been identified as most accident-prone in USA. The new Panama Canal Locks have had a significant impact on Texas Ports. There is a link to a TSGB Survey, a Correction to Last Month's (December 2017) Newsletter and a Letter to the Editor. Also we have got Kit Mitchell's Statistics Digest

Dr Shanta Bir Singh Tuladhar and Andrew Sharp

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Dates of the next TSUG seminars

Date	Venue	Topic
Wed-17-Jan	TfL	Car Fuel Use and Emissions—Trends and Future Patterns

The seminars can be booked through the TSUG website at www.tsug.org.uk/seminars.php

Statistics Digest

Statistics Digest January 2018

This digest lists major sets of statistics that have been released recently or which are due to be released. Regular monthly and quarterly releases are not included. The web links given allow free downloads of the documents cited.

Recent releases from Department for Transport

Recent releases from Department for Transport	
13 Dec	Domestic waterborne freight: 2016 https://www.gov.uk/government/statistics/domestic-waterborne-freight-2016
14 Dec	Annual bus statistics: year ending, March 2017 https://www.gov.uk/government/statistics/annual-bus-statistics-year-ending-march-2017
14 Dec	Concessionary travel statistics: year ending, March 2017 https://www.gov.uk/government/statistics/concessionary-travel-statistics-year-ending-march-2017
19 Dec	National Travel Survey factsheet - Comparing methods of collecting attitude data https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/668728/nts-household-self-completion-attitudes-compared.pdf

Forthcoming releases from Department for Transport

11 Jan 2018	Road freight statistics: July 2016 to June 2017 https://www.gov.uk/government/collections/road-freight-domestic-and-international-statistics
18 Jan 2018	18 Jan 2018 Walking and cycling in England: 2015 to 2016 https://www.gov.uk/government/collections/walking-and-cycling-statistics
18 Jan 2018	National travel survey: 2016 (part 2) https://www.gov.uk/government/collections/national-travel-survey-statistics
18 Jan 2018	Road conditions in England: 2017 https://www.gov.uk/government/collections/road-network-size-and-condition
1 Feb 2018	Renewable Transport Fuel Obligation: Year 9 (2016 to 2017) report 6 https://www.gov.uk/government/collections/biofuels-statistics
1 Feb 2018	Renewable Transport Fuel Obligation: Year 10 (2017 to 2018) report 2 https://www.gov.uk/government/collections/biofuels-statistics
8 Feb 2018	Reported Road Casualties in Great Britain, provisional estimates for (provisional) accidents involving illegal alcohol levels: 2016 https://www.gov.uk/government/collections/road-accidents-and-safety-statistics
Feb 2018	Provisional sea passenger statistics: 2017 https://www.gov.uk/government/collections/maritime-and-shipping-statistics

Forthcoming releases from Department for Transport

Feb 2018	Provisional road traffic estimates, Great Britain: January to December 2017 https://www.gov.uk/government/collections/road-traffic-statistics
Feb 2018	Travel time measures for the Strategic Road Network and local 'A' roads: January 2017 to December 2017 https://www.gov.uk/government/collections/road-congestion-and-reliability-statistics
Feb 2018	Seafarer statistics: 2016 https://www.gov.uk/government/collections/maritime-and-shipping-statistics
Feb 2018	Blue badge scheme statistics: 2017 https://www.gov.uk/government/collections/disabled-parking-badges-statistics
Mar 2018	Shipping fleet statistics: 2017 https://www.gov.uk/government/collections/maritime-and-shipping-statistics
Apr 2018	Vehicle licensing statistics: 2017 https://www.gov.uk/government/collections/vehicles-statistics
Apr 2018	Road traffic estimates in Great Britain: 2017 https://www.gov.uk/government/collections/road-traffic-statistics

Release from Eurostats

14 Nov 2017	Energy, transport and environment indicators - 2017 edition http://ec.europa.eu/eurostat/documents/3217494/8435375/KS-DK-17-001-EN-N.pdf/18d1ecfd-acd8-4390-ade6-e1f858d746da
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Release from Office for National Statistics

28 Nov 2017	National Population Projections: 2016-based extra variants https://www.ons.gov.uk/releases/nationalpopulationprojections2016basedextravariants
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Seminar Write-up

Members can find past seminar slides here: http://www.tsug.org.uk/past_seminars.php

TSUG Seminar: 13 December 2017 – Walking & Land Use

Q&A sessions By Andrew Sharp

Orla McCarthy TfL

Peter Gordon (TSUG) commented that there was a conflict for pavement space between pedestrians, cycle stands (good for active living) and trees (good for CO₂): how should we establish a balance?

Walking wasn't on the agenda and hasn't been for decades: it takes time to put it right. There is (I think) new guidance for local authorities coming out.

Stephen Plowden (retired) commented that if you are going to walk more, you need facilities for everyday life in your own area – within walking distance. This meant (probably) smaller shops and such-like, or improved delivery systems for shopping, or both

There was a target to get growth in areas where people can walk to local facilities.

Kit Mitchell (TSUG) asked which way walking trends in London were going. Nationally, the number of walking trips is going down because we are making fewer

trips of less than a mile (and most of these were for shopping and VFR). The level is reasonably steady at 24% of all trips.

Margherita Rendel, Torbay Line Users Group: The poor state of pavements is a deterrent. Local authorities don't have adequate funds: it needs to be a higher priority. Because of the lack of parking space, people drive over pavements and park in their front 'gardens' – damaging the pavements.

TfL only manage 5% of streets and have limited control over this. There are lots of trips and falls on the pavement – more than on the carriageway. Agree this is a deterrent.

John Cartledge, London Travelwatch. In the TfL Plan, is walking now a priority, rather than cycling as it was in the past? Or does it depend on the local highway authority? And what is likely to happen to mode share with autonomous vehicles?

The document is a draft for consultation and responses are being analysed. An Innovation Department within TfL is looking at the issue of autonomous vehicles: we need to keep this under review.

Robin Whittaker (retired) asked about dogs. Dog walking is not a 'trip' in this analysis, although it is a separate category in some research.

Peter Headicar, Oxford Brookes University, asked about the implications of reallocation of roadspace in terms of economic appraisal.

Beyond Orla's level of expertise! Agreed there was a need to include the health benefits of more walking as a result of roadspace reallocation and friendlier streets. She thought this might be done at project level

Bruce McVean, City of London

Heather Ward, UCL, said that she noticed cabs, minicabs and vans but few private cars. TfL have awarded more licences to cabs and minicabs and this seems to increase traffic.

The number of private cars was down, but cabs were up. Options included applying a congestion charge to cabs, or requiring them to meet higher standards.

Peter Headicar, Oxford Brookes University asked where the people previously driving had gone? 40% of traffic was private car in 1999 and 25% in 2016.

The Ring of Steel (set up against Irish terrorism) had reduced entry capacity, probably leading to re-routing away from the City. Parking space had been reduced, and this was a disincentive to driving.

Lucy Marstrand, Transport Initiatives, commented that current enthusiasm for autonomous vehicles ignores the health effects. Should appraisal put more emphasis on health and security (vehicles as weapons)?

Tom Cohen UCL asked about the relationship between walkability and distance walked.

No-one walks more than 2km. A 5-minute walk is certainly a limit for some, and of course the distance which can be walked in a given time decreases with age.

John Cartledge, London Travelwatch asked about School Travel Plans, and commented that the scooter seemed to be a significant mode of transport to and from school.

This was something they wanted to encourage: it was exercise, and better than being driven.

Peter Jones, UCL

Robin Whittaker (retired) asked about the impact of roundabouts with no pedestrian facilities.

There hadn't been any of these in his survey sites, although there was in the forthcoming study in Hereford.

Tom Cohen UCL commented that there were many factors causing severance – including noise and pollution. This was a good way of extending the evaluation process.

Phil Hows TfL (apologies if I didn't get the name right). What about induced demand – how was this evaluated?

Partly on a health basis – how far would people walk to get to a safe crossing point? If it was more than a 10-minute walk away, they wouldn't make the trip. This was the converse of 'induced demand' and both were important. In appraisals, induced trips tended to be valued at half the value of other trips – a controversial point.

Lucy Marstrand, Transport Initiatives asked about different values for different types of people on different types of infrastructure, commenting that for example provision of median strips could exclude children whose judgement of traffic speeds wasn't good.

The survey had asked people to rank different types of crossing facility: underpasses were particularly unpopular.

John Cartledge, London Travelwatch said that railways had massive severance issues! All changes would have some disutility to vehicular road users.

We needed to think creatively.

Stephen Plowden (retired) questioned whether values were too low, especially since long-term effects included health. He also said that underpasses could be designed well to be attractive – something necessary to ensure they were used.

Peter Headicar, Oxford Brookes University commented on the platooning effect caused by controlled intersections.

Fair point. It could make a difference to the usage of median strips or refuges.

TSGB Survey

By way of the 'blurb' that we've been using, that is as follows: 'The Department for Transport are reviewing the way in which Transport Statistics Great Britain (TSGB) is published. We are carrying out a user feedback survey to see how we can make TSGB a better, more informative and more user friendly publication moving forward. All contributions to this survey would be welcomed.'

The link for the survey is: <http://www.smartsurvey.co.uk/s/TSGBReview>

Let me know if you need anything else from me at all.

Many Thanks,

Jack

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General News

Correction to Last Month (December 2017) Newsletter

There are two errors in the article on page 10 of last month's issue – entitled 'Capacity or performance – either or both?'

The corrected sentence reads 'The GB network sees 20k trains/day carrying 4.5m passengers. It sees *900,000 train miles, 1.5m signals are passed at green*, and there are 220k station stops. 60% of trains are on time to the minute: 90% are within 5".

The words in italics are the corrected ones.

Apologies – and thanks to the reader who (with extreme tact) pointed this out.

Letter to the Editor

Dear Editor

You ask in your December 2017 edition why some train companies which do well in the passenger satisfaction league tables are nevertheless amongst those with the highest rate of recorded complaints when normalised by the number of passengers they carry.

This apparent discrepancy is of long standing, and is one reason why the prominence given in ORR's performance reporting to complaints data may be unfortunate.

Part of the explanation lies in the fact that comparing long distance with commuting (primarily London and south east) passengers is not comparing like for like. The former are more likely to be occasional travellers making more complex journeys with one-off tickets, while the latter are regular (generally daily) users making familiar journeys with season tickets. The type of ticket is important, because the largest category of complaints is those about ticket purchase and conditions.

Longer distance trains offer a greater range of facilities (discounted fares, seat reservations, catering, First Class, etc) and therefore a greater opportunity for something to go wrong. And although commuters are more likely to be dissatisfied with the treatment (known in the industry as "service") they receive, this is the daily experience of captive users who are therefore less likely formally to register their dissatisfaction unless things go more-than-usually awry.

There is also likely to be considerable variation in the accuracy (or consistency) of complaint reporting. Some companies are more punctilious than others in recording those made informally, e.g. in comments to staff. Some are better than others at soliciting feedback, e.g. by handing out forms for the purpose. There is subjectivity in deciding when a comment is sufficiently negative to qualify as a complaint. And when a comment contains references to multiple failures (e.g. punctuality, comfort, cost, information) this may be logged as one complaint or several.

Assuming that individual companies are reasonably consistent in their recording practices, changes over time in the volume of complaints they receive may be significant. But inter-operator comparisons should be treated with the same caution that statisticians would bring to generalisations embracing both oranges and apples.

Yours
John Cartledge

Disruptive Transportation

"Disruptive transportation: the adoption, utilisation and impacts of ride-hailing in the United States" by Regina R Clewlow and Gouri Shankar Mishra was published by the University of California Davis Institute of Transport Studies in October.

It summarises the evolution of shared mobility – from 'station based' car rental where cars had to be returned to the hiring point, to one-to-many car-sharing where pick-up and drop off of vehicles could be at different points, to P2P where individuals can rent out their own cars when they are not using them, to app-based ride-hailing (for example Uber and Lyft, sometimes called transportation network companies or TNCs), and shared ride-hailing (Uberpool, Lyft Line) and microtransit (app-based shuttles using dynamically-scheduled mini-buses).

While such services have generated much discussion, their impact is small. In North America, 2m people (less than 0.7% of the population) use car sharing.

Early research into car-sharing showed that users were 12% more likely to shed a vehicle (vehicles/household reduced from 0.55 to 0.29 – although a more recent study shows smaller reductions) and reduced vehicle miles travelled (VMT). Car-sharing was also associated with more walking, cycling and car-pooling but less transit use, although results across different surveys vary considerably. A 2016 APTA report showed users of shared modes were more likely to use transit and own fewer vehicles. A study in Denver showed that alternatives to ride-hailing were walking, biking or transit (34%) or not making the journey at all (12%).

The UC Davis study looked at data in the American Community Survey 2011-2103 for seven major Metropolitan areas in the US. Over 4000 responses were received, approximately 50:50 from dense urban neighbourhoods and suburban locations.

Of the respondents, 21% have personally used ride-hailing and a further 9% have used them with friends (they have not used an app). 24% use them at least weekly,

41% 1-3 times a month and 34% less than once a month. The most common activity is going to bars and parties (38% of adopters use it regularly for this purpose).

33% say they use it to avoid having to drive when they might have consumed alcohol (and there is evidence that drink-driving fatalities decrease when Uber is available). The second and third reasons given are the difficulty of finding parking and its high price (reinforcing the conclusion of several studies that reducing parking and increasing its price can reduce VMT).

The average age of ride-hailing users is 37: that of those not using it is 51. Over a third of 18-29 year olds use it: 4% of those over 65 do. Education and income levels are also positively correlated with use.

There are interesting overlaps between use of car-sharing and ride-hailing. 52% of those who use both transit and ride-hailing have a car: 46% of those who only use transit do. 30% of the former live in non-car-owning households, compared with 41% of the latter. Large numbers of Millennials did not own a vehicle but had access to one through a parent or friend.

91% of ride-hailing users had made no change to their car ownership (although 16% had no vehicle anyway). 9% had disposed of one or more. This is lower than previous surveys have found – although the authors claim that this is related to the sampling used in their survey.

29% of ride-hailers have reduced their VMT.

After the adoption of ride-hailing, 6% make less use of buses, 3% make more use of heavy rail, 3% make less use of light rail and 2% make less use of bike.

Microtransit

Edited from a CityLab article by Simon J Berrebi

Microtransit is a for-profit bus service that caters to commuters willing to pay more for a ride that's more direct and comfortable than those offered by existing public transportation. Since 2014, microtransit companies have been using sophisticated algorithms to plan fixed routes, based on demand, in San Francisco, Boston, and New York. The model has been hailed—and particularly by CityLab—as having the potential to change urban mobility.

In my PhD research and as an entrepreneur, I've developed algorithms to improve transit operations using real-time information. I believe that software can transform the place of transit in metro regions, and I support anything that helps the public move more efficiently. But microtransit is not living up to its promise these days. In just three years, three of the leading companies have gone out of business. In October, the California Public Utilities Commission forced Chariot, a microtransit company recently purchased by Ford for \$65 million, to cease operations for several days, after they found that drivers did not have the proper license to operate.

Unlike the jitney regulations, microtransit regulations already existed when these start-ups began operating. Class B licenses, which Chariot drivers lacked on three consecutive inspections, apply to tractors, trucks, and mini-buses. These regulations are not the product of overreaching government curbing innovation; they are in place to ensure the basic safety of drivers and passengers. If a private transportation company cannot make a profit while providing a safe service, then it should not be in business.

Microtransit is squeezed between the high cost of complying with regulations, and providing a service that people can afford.

After raising \$2.5 million, Leap Transit went out of business in July 2015 following a cease-and-desist order for failing to meet safety and insurance requirements in California, where it had been operating in San Francisco. Another Bay Area mini-bus venture, Loup, failed despite receiving \$1.5 million from Twitter co-founder Evan Williams' Obvious Ventures. Earlier this year, Bridj shut down after a pilot in Kansas City fell short of expectations, and a large injection of capital, reportedly from Toyota, fell through. In every case, microtransit companies race for private investments to subsidize increasing operating costs as local governments enforce regulations—with the hope, of course, of eventually returning that investment. “Not to sound dramatic [but] no one in the history of the world has created a profitable mass transit service,” Chariot CEO Ali Vahabzadeh told *The Verge* earlier this year. “That’s our mission.”

But public transit is not supposed to be judged on whether it turns a profit. Like private cars, air travel, and freight, public transit needs to be subsidized to offer benefits that extend to society at large. Transit generates economic growth, promotes healthier lifestyles, and enables access to opportunities while minimizing the negative externalities of transportation, like air pollution and traffic congestion. The high occupancy of public transit can make the most effective use of limited space and energy resources. Transit provides mobility for those who would otherwise have no way of participating in society.

To maximize ridership, microtransit companies focus exclusively on the most travelled corridors, which are often the most popular bus routes. Leap, Loup, and Chariot got their start on San Francisco's Route 30. But with 14-person capacity, microtransit's mini-buses do not compare to 40-foot transit buses that can carry up to 80 people. It is hard to say whether microtransit increases or reduces traffic overall, which depends on the transportation modes customers switched from. But in any case, microtransit takes away riders and revenue from transit agencies' most popular routes. This makes it more difficult for transit agencies to provide service to isolated neighbourhoods and mobility for those who cannot afford the higher fares charged by private companies.

Chariot aims to be more than a niche business for the advantaged portion of the country. But microtransit is squeezed between the high cost of complying with regulations, and providing a service that people can afford. Other than subsidies, there is no proven, scalable solution to this problem. As Chariot and its competitors expand, the fixed cost of developing software is diluted. But the bulk of their operating costs, such as providing safe vehicles and qualified drivers, will remain high. And the social impact may become a net negative, for as microtransit grows, it threatens to push public transportation further into decline.

Traditionally, transit agencies have considered software as peripheral to service. Using crowd-sourced route planning and running smaller vehicles along less travelled routes could help agencies better address some customers' evolving needs. Perhaps microtransit companies could provide these services, and help agencies expand their impact and operate more effectively. But public leaders should take the reins to envision the kind of service they want to deliver and the tools they need for that. To be accessible to all and benefit society as a whole, innovation should come from within.

Still Going ... and Going: the Emerging Travel Patterns of Older Adults

This was published by the Institute for Mobility Research (IFMO). Points I picked up were as follows.

In the past, the mobility patterns of those aged over 65 tended not to attract much attention, because they travelled less than other age groups. This is now changing. The senior generation is a multi-segmented group: there is no homogenous group we can label 'old'.

The research looks at a 2025 baseline, and two extreme but plausible mobility scenarios for Germany and the US.

These two countries plus the UK and China helped to investigate cross-national differences. Issues investigated included population change; pensions, wealth and workforce participation; life expectancy and health; living arrangements and social connections; and transport options and the use of technology.

There is a plot of distance travelled/trip maker by age group in Germany in 1976, 1982, 1997 and 2012. There is a visible decline with age, but it happens later and later in life. Those aged 60-69 travelled just under 20km/day in 1976, but 40km/day in 2012.

Those aged over 60	Trips/day	Minutes spent travelling/day	Km travelled/day
USA 1983-2008	+30%	+50%	+40%
England 1985-2012	+10%	+10%	+70%
Germany 1982-2012	No change	+10%	+40%
Japan 1987-2010	No change	No change	+30%

Typically, mobility first drops on retirement (around 60+). The extent of the drop depends on whether individuals cease work entirely or transition into part-time employment. The next inflexion point is when mobility becomes impaired – breaking a hip, decline in eyesight, becoming unsteady on one's feet.

In Germany, mobility declines at the rate of around 1km/day for each additional year of age (so those who are 10 years older have approximately 10km less daily mobility). On average, retirement knocks 10km/day off mobility and mobility impairment 2km. Urban seniors record 4km less mobility than those living in rural areas: men report 6km more than women. Those with a car available travel 13km/day more than those without.

Car ownership in Germany has increased steadily among the over 65s. In the US, car ownership approaches 1/person compared with 0.8/person in Japan.

By 2025, it is forecast that 25% of Germans will be aged over 65 (even with 'ongoing positive migration'). In the US, that proportion is likely to be 19% with continued immigration: in the UK it is expected to be 20% and in China, just 14%.

In Germany, workforce participation decreases sharply after age 65: those who do work, work less. In the US and the UK, workforce participation among the over-65s is on the increase.

UK Tourism Satellite Account

ONS recently released data on these in a report which can be accessed at <https://www.ons.gov.uk/economy/nationalaccounts/satelliteaccounts/bulletins/uktourismsatelliteaccountuktsa/2015>.

If you are really interested (or need to know more about satellite accounts generally), you need to look at it: it's very difficult to summarise.

Tourism direct gross value added rose 7% year on year to £64.6bn in 2015. Preliminary figures for 2016 show continued growth (of the order of 2.2%).

Tourism direct employment increased 6.9% to 1.5m in 2015 – mainly in water transport, rail transport, and food and beverage serving

Domestic tourism expenditure rose from £105.1bn in 2014 to £108.9bn in 2015, mainly due to an increase in overnight stays. Expenditure by inbound tourists rose by 0.8% to £25.7bn.

US Transportation Fatalities in 2016

The National Transportation Safety Board recently published data for fatalities in the transportation system in 2016 – see <https://www.nts.gov/investigations/data/Documents/US-TransportationFatalities2016.pdf>

Of the roundly 39k deaths, 37.4k were on the highway system (13.4k in cars, 10.3k in light trucks and vans, 6k pedestrians and 5.3k motorcyclists). 660 died on freight, passenger and commuter rail (of whom 487 were trespassing): there were 266 fatalities at level (grade) crossings. 73 died in the rail transit system: trespasser data are not available for this category. There were 730 marine deaths, most of them during recreational boating, and 412 in aviation (almost all in the general aviation sector). Finally, there were 16 fatalities in the pipeline transport sector.

US – Fewer Foreign Visitors

From The Hill

Fewer international travellers have been visiting the United States over the last year, according to new government statistics. Between June 2016 and June 2017, overall international inbound travel decreased 3.9%, according to the National Travel and Tourism Office. The biggest drop in travel has been from Mexico, with a 9.4% decline in visitors coming into the country. The new data comes amid increasing concern from the U.S. travel industry that the Trump administration's efforts to tighten border and aviation security could discourage legitimate visitors from coming to the U.S.

The White House has implemented several new travel restrictions this year, including issuing a temporary ban on nationals from certain Muslim-majority countries and prohibiting laptops on the cabins of select U.S.-bound flights. On the campaign trail, Trump also talked about enforcing a "Muslim ban" and promised to build a wall along the U.S.-Mexico border. The travel sector has been urging the administration to more clearly communicate who is welcome to the U.S., warning that Trump's policies could have a chilling effect on the \$250 billion industry if not they are accompanied by proper messaging. Travel is the country's second-largest export and supports more than 15 million American jobs, according to the U.S. Travel Association.

"The latest government travel data is deeply concerning not just to our industry, but to anyone who cares about the economic well-being of the United States ... These numbers are an undeniable wake-up call, and correcting this troubling trend needs to become a national priority," Roger Dow, president and CEO of the U.S. Travel Association, said in a statement.

Bus

Bus Ridership in Chicago

Edited from Metro Magazine

A recent report analyses the recent drop in Chicago bus ridership and outlines low-cost ways to improve service and increase bus ridership.

While Chicago Transit Authority (CTA) rail ridership has generally grown over the last few years, bus ridership has declined rapidly, according to a report from the Active Transportation Alliance called "Back on the Bus." From 2015 to 2016, bus ridership in Chicago fell by more than 15 million rides (5.8%), continuing a recent trend of fewer Chicagoans riding the bus. Since 2012, bus ridership has declined in Chicago by more than 17%, and it's dropped by more than 21% since pre-recession levels in 2008.

Fewer Chicagoans riding the bus means more driving and more cars on our already congested streets. The city's hub-and-spoke rail system continues to be a good option for people who live and work along the lines and in the Loop, but many neighbourhoods lack access to it. Back on the Bus identifies ways that city officials can improve bus service and reverse the trend of Chicagoans abandoning public transit for less efficient transportation options.

Lower quality bus service has major equity impacts. A disproportionate number of bus riders live in low-income communities or work in places that lack access to the rail transit system. Sub-standard bus service hurts these Chicagoans the most while discouraging higher-income residents otherwise inclined to ride transit from riding the bus more frequently.

Without more investment in bus service, Chicago risks more people abandoning transit for transportation options that are more expensive and less efficient, healthy, and green.

The report advocates bus service upgrades that will improve the speed and reliability of bus service and help retain and attract riders, including:

- **Dedicated bus lanes:** Give crowded buses priority on more city streets with dedicated bus lanes;
- **Traffic signal improvements:** Move buses more smoothly through busy intersections by changing signal timing or using technology that gives buses an extended green light; and
- **Faster boarding:** Make it easier for riders to pay their fare before boarding and allow riders to enter the bus through the front and rear doors by tapping their transit card.

Chicago trails its peer cities in implementation of each of these improvements. For example, the city has only 6.6km of dedicated bus lanes, far less than San Francisco (43.5km), Seattle (56km), Los Angeles (57km), Miami (64km), and New York City (133.5km).

In addition to potential service upgrades, the report includes recommendations for policies that support bus ridership growth, such as creating effective ways to fairly enforce bus-only lanes and reforming regulation of ride-hailing providers like Uber and Lyft.

Rail

Amtrak Routes in Virginia

The Virginia Department of Rail and Public Transportation (DRPT) recently announced that passenger train ridership had increased during the fiscal year ended September 30 on most of the Amtrak routes that agency supports in Virginia. Those gains, it said reflected public demand "for safe, reliable, and comfortable transportation alternatives."

The DRPT supports the operation of six Amtrak trains that connect the Roanoke valley, central Virginia and Hampton Roads to Washington DC, and other cities along Amtrak's Northeast Corridor. The DRPT said its Norfolk route, which includes one daily round-trip to Washington DC, served 155,389 riders in fiscal 2017, for a 6% rise from a year earlier. The route that links Roanoke and Lynchburg with Washington DC on a daily round trip saw a 2.7% increase to 189,811 riders. The Newport News route with two daily round trips served 331,308 riders, for a 0.5% gain. The agency said demand was "relatively steady" at 174,935 riders on its Richmond route, which features two daily state-supported round trips to Washington DC.

The DRPT said train ridership cuts highway demand by about 271 million miles of personal vehicle driving in Virginia every year, which also prevents about 3,000 accidents and saves lives.

DB Regio to cut Diesel Consumption



DB Regio says it hopes to cut diesel consumption by around 10% by equipping around 1000 rail vehicles with telematics systems for energy-efficient driving.

By the end of next year around 90% of locomotives and DMUs will be equipped with driver advisory systems which monitor where and when diesel consumption is highest, and guide the driver on how to drive the train more efficiently.

DB Regio Train at Koln-Deutz

Data are transmitted to central servers and monthly reports are generated for drivers. The telematics system also records data on the maintenance and operating status of each vehicle, as well as the regulation and preheating of HVAC systems.

DB Regio says the project, which is part of DB's Future Rail programme, could reduce CO₂ emissions by up to 30,000 tonnes/year.

Rail Factsheet

This was published by DfT in November 2017.

In England, people are making fewer trips, travelling shorter distances and spending less time travelling than 14 years ago. However, rail usage has grown since 2002 – trips by 56%, distance by 23% and time by 43%. By contrast, car, van and bus travel statistics have all gone down.

In Great Britain, rail passenger journeys have more than doubled in the last 20 years: in London & the South East, where most (69%) rail journeys are made, they have increased by 16% in the last 5 years.

There were over 583k arrivals by train in the morning peak in London, compared with 42k in Birmingham, the next largest destination.

Over half of all rail trips were for commuting, with 23% for leisure, 10% business, 5% shopping and 5% other.

Those in the highest income level (top 20%) make 43 trips each. In the second quintile it's 23, and the third, 17.

Rail is the safest conventional mode of transport in the UK – twice as safe as air and 300 times safer than car.

In Great Britain in 2016/17, there were 2560 stations and 15811 km of route (of which 34% was electrified). Average age of rolling stock was 21 years. Carbon emissions/passenger km are down 29% from 2005/06.

Report on Rail Use in France

From Railway Gazette International



Paris Gare du Nord

In a report on rail passenger services covering 2015 and 2016, regulatory body Arafer found that rail's market share had fallen by an average of 0.5% a year since 2011, whereas that of other modes had increased.

Published on November 16, the report said that rail had a 9.2% share of the French transport market in 2016. A low point of 7.1% was recorded in 1995, when services were affected by serious industrial

disputes, after which the figure rose to reach 10% in 2011. The 2016 figure was two percentage points ahead of Germany and 4 points ahead of Italy. The European average is just 7.7%: rail's market share in many other European countries has been rising rather than falling over the same period. The report pointed to car sharing (bla-bla-car) and deregulation of long-distance coaches as factors that may have influenced the French market.

In 2016 passenger services on the 28 800 route-km national network handled 1.16 billion passengers, representing 87 billion passenger-km, equivalent to about 3.2 million trips a day. About 88% of journeys were made by TER or Transilien services. Average load factors were 25% for TER services, and some TGV services attained 67% (which looks low considering they are market priced).

Passenger-km fell by 1% compared with 2015, whereas trips by private car, including car sharing, rose by 2.7% and long-distance coach travel increased by 17%.

Usage of TER services declined by 2.8%, with traffic on international trains dropping by 7.8% and on domestic inter-city trains by 6.5%. TGV traffic was stable with a 0.1% increase, and there was a 3.8% rise on Transilien services.

Arafer noted a stark contrast in network utilisation, with just 27% of the network carrying 80% of all passenger trains and 31% of the network handling just 1% of passenger services.

Arafer also analysed the quality of service, finding that an average of 346 or about 5% of trains a day were cancelled in 2016, mainly because of strikes during the second quarter. Excluding Transilien services, trains accumulated a total of 11million delay-minutes in 2015, more than half of which were attributable to 'manageable' factors that were the responsibility of SNCF Réseau or the operator. About 11% of trains arrived at their destination with a delay of 6 minutes or more.

Revenue in 2015 amounted to €13.4bn, of which €8.3bn was from fares and €5.1bn was in the form of grants, compensation or subsidy from the public sector. TER services received a total of €3bn in grants, representing nearly 75% of income, while Intercités services attracted €300m of public funding (32%); grants towards Transilien services amounted to €1.7bn (62%). A further €100m was provided as compensation for certain fares on TGV services. Average fare/passenger-km was €0.08. This figure takes into account passengers travelling on free tickets — about 5% of passengers on TGV services travel at no cost

Access charges paid for use of track and stations amounted to 31% of income on average, with TGV services paying 38%.

The Impact of the Gotthard Base Tunnel

From www.swissinfo.ch

On 11 December it was exactly one year since the first trains started using the Gotthard Base Tunnel – the world's longest rail tunnel.

It opened on December 11, 2016. Since then, passenger and freight train traffic through the Alps has increased significantly. Over the past year, an average of 11,000 train passengers have passed through it every day – 30% more traffic than on the old Gotthard line. Despite this increase in passenger numbers, the punctuality of trains has improved "markedly" according to Swiss Federal Railways. In all, 18,395 passenger trains and 24,757 freight trains passed through the new tunnel, with up to 165 convoys on peak days.

Tourism has been one of the main sectors to benefit from the increased traffic through the new tunnel. South of the Alps, canton Ticino recorded a 7.7% rise in overnight stays during the first seven months of 2017. This is the best result since 2010. This success "is not just the result of the Gotthard Base Tunnel, but its

opening has played a major role,” says Lorenzo Pianezzi, president of the Ticino Hotel Association.

There has also been an impact on the number of visitors travelling northwards to German-speaking regions on the other side of the Alps, which the specialist tourism magazine Hotel Revue refers to as “the tunnel effect to the north”. In central Swiss cantons Lucerne and Uri, the number of Italian tourists has increased significantly.

As part of the revised timetable changes, the Gotthard tunnel is playing an even more important role in international north-south traffic. There are now direct daily connections between Frankfurt and Milan, and Zurich and Venice.

The line through the Alps will reach its full potential by the end of 2020, when Ticino opens the other central element of the new Gotthard line – the 15.4-kilometre-long Monte Ceneri Base Tunnel (15.4 km). Within three years, fast trains will reduce the current journey time between Zurich and Milan by 30 minutes to under three hours.

Air

Are We Nearly There Yet?



Research by Emirates Airline shows that it takes just short of 50 minutes for this question to emerge from the average child on a flight

They have also produced useful advice, and a table showing a matrix of activities times length of time it they keep children in specific age groups occupied

Emirates A380 at San Francisco International Airport

<file:///C:/Users/Andrew/Downloads/Child%20Boredom%20Quotient%20Tables.pdf>

Busiest Air Routes

Routesonline published lists of busiest air routes – total and international.

The top 20 routes in the world are as follows. Note that airports (as well as cities) are only given where there is the possibility of confusion. Numbers are numbers of passengers in July 2017 (in millions).

Jeju – Seoul Gimpo	1.285
Sapporo – Tokyo Haneda	0.688
Sydney – Melbourne	0.663
Tokyo Haneda – Fukuoka	0.622
Delhi – Mumbai	0.537
Ho Chi Minh City – Hanoi	0.531

Shanghai Hongqiao – Beijing	0.522
Hong Kong – Taipei	0.452
Okinawa – Tokyo Haneda	0.443
Surabaya – Jakarta	0.424
Chengdu – Beijing	0.398
Tokyo Haneda – Osaka Itami	0.395
Denpasar – Jakarta	0.376
Shanghai Hongqiao – Shenzhen	0.372
Makassar – Jakarta	0.371
Jeddah – Riyadh	0.365
Guangzhou – Beijing	0.361
Shenzhen – Beijing	0.359
Shanghai Hongqiao – Guangzhou	0.353
Delhi - Bengalaru	0.352

The top 20 international routes are similarly dominated by Asia.

Hong Kong – Taipei	0.452
Jakarta – Singapore	0.322
Kuala Lumpur – Singapore	0.269
Seoul – Osaka Kansai	0.234
Hong Kong – Shanghai Pudong	0.226
Taipei – Osaka Kansai	0.200
Seoul – Hong Kong	0.198
Bangkok – Hong Kong	0.197
Taipei – Tokyo Narita	0.197
Kuala Lumpur – Jakarta	0.196
Hong Kong – Singapore	0.187
Domodedovo – Simerfopol	0.186
Singapore – Bangkok	0.174
Hong Kong – Beijing	0.170
Seoul – Tokyo Haneda	0.166
Palma – Düsseldorf	0.166
Seoul – Bangkok	0.163
Osaka Kansai – Hong Kong	0.163
Hong Kong – Manila	0.163
Manila - Singapore	0.157

Chinese Airline Subsidies for Regional Operations 2017

Source: CAPA

(10 ¥ is approximately £1.15)

China Eastern Airlines 176m ¥

Tibet Airlines 152 m ¥

Tianjin Airlines 136 m ¥

China Southern Airlines 121 m ¥

China Express 98 m ¥

The total for CAAC as a whole was 988 m ¥

The Growth of Middle East Air Connections



An article in a recent issue of the *Journal of Air Transport Management* ('A comparative analysis of hub connections of European and Asian airports against Middle Eastern hubs in inter-continental markets' by Christopher Piltz and colleagues) attempted to analyse the recent impact of the growth of the big three Middle Eastern airlines – Emirates, Etihad and Qatar. In the last three years, Qatar's Doha hub has overtaken Zürich and

Doha Hamad Airport

Vienna in passenger numbers; Istanbul has overtaken Amsterdam and Frankfurt; and Emirates' Dubai hub has overtaken Frankfurt.

The research looked at two specific markets – the US East Coast to South Asia, and to South East Asia. Looking at 12 hubs where connections can be made, Middle Eastern ones have increased their share of connections at the expense of European ones.

In the US – South Asia market, Dubai, Doha and Abu Dhabi have overtaken Heathrow for connecting passengers. Heathrow has lost the most market share, although Brussels has virtually disappeared (mainly because Jet Airways now hubs through Amsterdam rather than Brussels). The absolute number of passengers on non-stop flights has remained constant while there has been a 5.9% increase in passengers making connecting flights.

In the US – South East Asia market, Middle East hubs have quadrupled their market share – again, at the expense of European hubs. Here, there has been a 12.8% increase in passengers using connecting flights.

A table looks at journeys between New York JFK and Mumbai, and lists the number of flights/week, flight time and connecting time, and weekly passenger numbers through a range of hubs. Shortest travel time is via Heathrow (1015 minutes): there are 6 connections and 135 passengers/week this way. However, the largest number of passengers (520) fly through Abu Dhabi, where there are 12 connections a week taking 1130 minutes. 447 fly through Dubai (6 connections/week, 1035 minutes) and 136 through Doha (6 connections, 1150 minutes). Kuwait manages to attract 103 passengers/week on its two connections each week taking 1150 minutes.

Another table looks at the share of connections for selected hub airports in June 2012 and June 2016. Dubai, Abu Dhabi and Doha have grown by 16.9%, 10.1% and 4.3% respectively: Heathrow has dropped by 15.5% (from 26.2% of connections to 10.8%). Heathrow has the fastest travel time among the top five connecting hubs, but Middle Eastern hubs compensate by providing efficient connections. Average connecting times at Frankfurt are 277 minutes, at Amsterdam 204 minutes, at Heathrow 200 minutes compared with 135 at Abu Dhabi, 155 at Dubai and 166 at Doha. Longer flight times when connecting at Middle East hubs are compensated for by shorter connecting times.

The researchers find that 46 of the 63 origin markets in the Eastern US going to Thailand have no Middle East route options. The implication is that Middle Eastern carriers are being kept out of some markets.

The researchers regret that they have no data on price or fare paid: some qualitative comparison might also be useful.

Recent IATA Statistics

In early December, IATA published its Air Passenger Market Analysis for October.

Key points were that Global revenue passenger kilometres (RPKs) rose by a robust 7.2% year-on-year in October, up from 6.0% in the previous month. As expected, volumes rose strongly in seasonally adjusted month-on-month terms after the hurricane-related disruption in September. The upward trend in RPKs has moderated over the course of the year, but remains solid by historical standards.

Global RPKs have now grown by 7.7% in annual terms so far this year. All told, 2017 remains on course to be another year of above-trend passenger growth, some way ahead of the ten-year average pace (5.5%).

Domestic US passenger volumes bounced back in October, while India topped the domestic growth chart once again.

The upturn in global economic conditions is continuing to lend support to passenger demand growth. The composite Purchasing Managers' Index (PMI) – a measure of global business confidence, which has proved to be a useful leading indicator of air passenger demand growth in the past – recently rose to its highest level since early-2015. It is currently consistent with year-on-year RPK growth remaining in the region of 7-7.5% over the final two months of 2017.

The current broad-based global economic upturn is expected to persist into 2018, and is likely to continue to offer support to passenger demand growth.

Road

Google Street View Can Reveal How Your Neighbourhood Votes

Edited from CityLab https://www.citylab.com/transportation/2017/12/google-street-view-data-demographics-cars-research/547436/?utm_source=nl_link1_120617&silverid=MzEwMTkyMzI5MTI4S0

If you walk through a city and see more pickup trucks than sedans (saloon cars) parked on the side of the road, there's a good chance most residents there vote Republican. This sounds like just another stereotype—that Republicans cruise around in pickups while Democrats prefer the Toyota Prius. But may be there's some truth to it after all.

That's what a team of artificial intelligence researchers at Stanford University have found from their efforts to predict demographics and voting patterns based solely on Google Street View images of cars. Working with some 50 million Street View images from over 200 cities, researchers developed two algorithms. One detected and classified the cars into more than 2,600 distinct categories based on things like the make, model, body type, and age. (Given how blurry many of the images are, that was quite the accomplishment.) Then, using data from the Census and the 2008

elections, they trained another algorithm to predict the income level, racial makeup, educational attainment, and voting patterns for different tracts and precincts based on what cars are present.

Among the findings: Toyota and Honda vehicles are strongly correlated with Asian neighbourhoods, in line with surveys that suggest car owners of Asian descent prefer Asian brands over American ones. Meanwhile, black neighbourhoods are more strongly associated with Buick, Oldsmobile, and Chrysler vehicles. The presence of pickup trucks, Volkswagens, and Aston Martins indicate mostly white neighbourhoods.

It's not perfect but when the researchers compared their model's prediction to actual data from the American Community Survey, their estimates weren't far off. The model accurately determined that Seattle, Washington, is 69% Caucasian, with African Americans mostly residing in the southern neighbourhoods. Similarly, the model was correct in predicting that the lowest-income part of Tampa, Florida, was at the southern tip. More surprising, even to the researchers themselves, is the accuracy with which the proportion of pickup trucks to sedans in a precinct—an area of about 1,000 residents—determines whether residents there lean Democratic or Republican. In Gilbert, Arizona, the model correctly identified the voting patterns of 58 out of 60 precincts—a 97% accuracy rate. Overall the model indicated that a city with more sedans has an 88% chance of voting for a Democrat in the next election, and those with more pickup trucks are 82% more likely to vote Republican.

Given how several counties flipped their support in last year's election, the team can't say how the result would look using more recent Street View images and voting data from 2016. (The Street View images used in this research are from 2013.)

The use of machine learning like this is a potential game-changer for large-scale surveys, though it wouldn't be without caution—one best described by the former Wall Street analyst Cathy O'Neil in her book **Weapons of Math Destruction**: “The math-powered applications powering the data economy were based on choices made by fallible human beings. Some of these choices were no doubt made with the best intentions. Nevertheless, many of the models encoded human prejudice, misunderstanding and bias into the software systems that increasingly managed our lives.... And they tended to punish the poor and the oppressed in our society, while making the rich richer.”

But it can help with something like the American Community Survey, which the researchers note cost the government more than \$250 million/year to conduct. They think that as AI technology advances, it can not only cut down on labour and costs, but more importantly, reduce the time lag. The model is not accurate enough to replace the manual process, but applying something like this before collecting the survey data can give more up-to-date information, although it's a bit noisier. It can also be used to assess where areas are changing very quickly or which neighbourhood is getting worse, giving policymakers a head start in implementing the right initiatives early on.

And as society changes (say, Millennials stop driving or cities finally figure out how to go car-free) models like his can be trained to analyze other possibly telling aspects, like building architecture, or the type of trees planted, or maybe even pedestrians—though there are privacy concerns here.

Hacking as a Form of Transport

(from Metro Magazine)

Inhabitants of “Transit Deserts” often use creative and flexible methods, such as “hacking” or the use of personal taxis, to make up for transit deficiencies. Hacking is a booming economy in Baltimore’s African-American community, whose residents often prefer to call or flag down drivers to taking public transportation. Hacking is, like the “van” systems found in many African and Caribbean countries, an underground economy that grows around the demand for public transportation infrastructure among those living on the geographic and political margins of society.

In American cities, hacking is basically Uber for the poor, in that many low income residents do not have credit cards, and therefore cannot use registered ridesharing services. Although illegal, underground ride sharing is driven by genuine need, as a response to lack of transit and neighbourhood form. Despite the inherent risk in travelling alone in a stranger’s vehicle, the practice persists. Considerably quicker and more convenient for those without a car than taking the bus, subway, or light rail, and costing less than a taxi cab, it offers the distinct advantage of taking the rider directly to a destination, rather than via a roundabout public transit route

Although race is a factor for why people hack, as legal taxi cabs routinely pass by people of colour, it’s not the only one. Hacking originally concentrated outside of grocery stores, spread as drivers picked up people up along streets signalling for rides. A variety of people use hacks, including women with groceries, college students, and people going to work. In Baltimore, it has evolved into a quick and easy income source, with drivers organizing into Hack Clubs. Drivers can be categorized into three groups: blue collar retirees, those using hacking as a second income, and those who have not been able to find mainstream employment, due to prison records or lack of education. The latter group includes women, many with disabilities or laid off from other jobs. While the Baltimore police department classifies hacking as an illegal activity and is highly aware that it exists, crackdowns have not typically occurred.

Roundabouts Saving Lives

Roundabouts are not common in the US – to the point that those which are there are sometimes seen as tourist attractions. However, over the last quarter century they have started to be introduced – with good results.

The Minnesota Department of Transportation reports that a recent study shows that roundabouts are reducing serious injuries and saving lives. There are now nearly 200 roundabouts in the State and they are performing well.

A recent study (which your editor has not studied) which examined the safety performance of roundabouts found that there was an 86% reduction in the fatal crash rate at intersections where roundabouts were installed and an 83% drop in serious injuries. For the study, data on crash rates and traffic volume were collected from 144 roundabouts.

The study shows that there have been no multi-vehicle fatalities at any roundabout in Minnesota.

Provisional Road Traffic Estimates: Great Britain October 2016 – September 2017

This factsheet was published by DfT at the end of November.

Compared with the year ending September 2016, total motor vehicle traffic was up 1% at 325.5bn vehicle miles.

Car and taxi traffic was up 0.9% at a new high of 253.7bn, light commercial vehicle traffic up 3% (at a record 50.1bn) and HGV traffic down 1.5% at 16.5bn (just over 5% of the total).

Car traffic has grown in every quarter since June 2013, but this is the first quarter when the annual increase was less than 1%.

“Suicides on UK Roads – Lifting the Lid”

This was the title of a report produced by PACTS in October (in cooperation with, among others, the Samaritans).

Right up front, it comments on responsible reporting and terminology in this sensitive area.

Around 6000 people take their own lives by suicide each year in the UK. The suicide rate in Great Britain (10.1/100,000 population) is close to the global average of 10.7.

The best estimate is that over 50 deaths by suicide occur each year on the roads in the UK: neither the absolute number nor the number of suicide attempts is known with any degree of accuracy.

The socio-economic cost of each death by suicide of someone of working age (and it is the biggest killer of men aged 20 – 49) is estimated to be £1.67m.

Almost 300 people take their lives each year on the UK rail networks: this is by far the largest cause of death on the railways. 15,000 rail staff have received suicide prevention training. In 2016/7, BT Police recorded the following numbers relating to the rail networks – 290 deaths by suicide, 2233 recorded attempts of which 85 survived with serious injury and 47 with minor injury, and 1811 people physically prevented from taking their own lives.

On the roads, numbers are far less definitive. For the Strategic Road Network in England, suicide attempts were 856 in 2014, 790 in 2015 and 568 in the first half of 2016.

In Sweden, between 2010 and 2015 151 people died by suicide on the roads, compared with a total road traffic collision fatality number of 1659. Since 2010, numbers of suicides in road traffic have been separated out: in 2010/11, before the new classification system was introduced, 6% of road fatalities were classed as suicides: it is now 10%. More accurate recording leads to better preventative action.

PACTS requested information from police forces, local authorities and coroners: data available was very incomplete, so any published figures are highly likely to be understated. In their first request to police forces, 34 (79%) said they did not hold the information or were unable to provide it, 16% had and provided the information requested and 5% did not respond. In the second request (for a year's data, rather than three consecutive years as in the first request) percentages were 61, 23 and 16.

For a coroner to record suicide as a cause of death, a 'criminal' standard of proof (beyond reasonable doubt) is necessary. Anecdotally, if this changed, many more

road suicides would be recorded. The police Stats19 road accident reports specifically exclude suicides – and only include incidents involving a vehicle, so jumping off a bridge would not be recorded anyway.

Highways England is introducing a strategic approach to road-related suicide, as part of their commitment that no individual be harmed whilst travelling or working on the Strategic Road Network: a strategy and toolkit was to be rolled out in late 2017.

The report concludes with a number of recommendations.

The Most Dangerous Roads in the US

There is a chart on <https://www.teletracnavman.com/infographics/most-dangerous-roads-in-america> which shows the most dangerous roads in the US, in terms of fatalities/mile.

Florida's Interstate 4 runs through Tampa, Orlando and Daytona Beach and has been identified as having the highest ratio of road fatalities to distance for any road section in the US. The report was compiled by Teletrac Navman and highlights the section that runs past Orlando as being particularly dangerous. According to the report, Interstate 4 has 0.78 deaths/km (1.25/mile) putting it into first place for the top 25 most dangerous highway stretches in the US.

Interstate 4 is currently the subject of a major upgrade project, which will hopefully reduce the fatality rate. However it is of note that the design of the highway itself is not the cause of the majority of the crashes. Florida's road safety record is poor for the US, with a comparatively high rate of drink driving being a key problem. Distracted driving and speeding are also recognised as major problems for road safety in Florida.

Sea

The Impact of the New Panama Canal Locks on Texas Ports and the Texas Economy

This report was published by the University of Texas at Austin in October.

New locks were completed in the Panama Canal in 2016 at a cost of \$5.2bn: these permitted the transit of larger vessels. The studies which justified enlargement were made in 2007: much changed in the construction decade, including a doubling in the size of container ships and the growth of fracking.

80% of the world fleet can now use the canal, compared with 45% before. 85% of container ships, 100% of liquefied petroleum gas (LPG) carriers and car carriers, 82% of liquefied natural gas (LNG) carriers and 85% of bulk carriers can use it: for LNG and LPG carriers in particular, this is a significant increase on the percentages which could use the old locks.

The number of 'neopanamax' ships– those which can use the new locks – increased from 59 in July 2016 to 108 in October and 160 in January 2017. On average, over 5 neopanamax ships use them each day: over 14% of usage is by these ships which could not use the canal before. The canal authority currently restricts the number to six a day, presumably because of water consumption.

One impact on Texas has been from the larger number of containers and the peakiness of demand for container transit now that larger ships are being used. 13,000 TEU ships can now use the Canal. Another recent development has been the formation of alliances among container ship operators: there are three of these (OCEAN, 2M and THE Alliance) with 11 participating carriers. This has created additional work (and therefore cost) at terminals: containers need additional sorting.

West Coast-based railroads have taken steps to protect their container business, with BNSF and UP investing \$12bn over 5 years in facilities in southern California alone.

The increase in containers was forecast: the increased use by ships carrying fuel was not. In the first six months of the year, 465 LPG and 133 LNG ships came through the canal – mainly with cargoes from Texas and Louisiana to Mexico and Asia.

The report looks at individual ports (and most of the Texas ports have rebranded themselves – ‘Port Houston’ and not ‘Port of Houston’). Container traffic has grown at Houston, for example, particularly with East Asia: this is expected to grow. Each port faces different challenges – sea-side access (dredging of channels), port and terminal operations (capacity) and landside connections. Each tends to have a different focus – Houston on containers and Corpus Christie on energy, for example.

Panamax ships – which would fit in the unmodernised canal – could carry 4500 containers: the next phase of container ship development could accommodate 10,000 containers and these ships needed 45 feet of water to operate safely. Since 2006, sizes have continued to grow – there are now over 120in service or on order which will carry 14,000 – 20,000 TEU. These need a depth of 50 feet, and deck cranes with a reach of 80 feet. But moving from a 4,000 TEU ship to a 12,000 TEU one cuts operating cost/container by 20%.