

Helping people, cities
and economies thrive

North American
Edition
Issue 18
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The Review

Spotlight

Understanding the
transit ecosystem:
where to innovate

Leading edge

A case for
disinvestment
business cases

Transit

An all-door
boarding solution



We are Steer.

After 40 years, we are shortening our name to Steer to reflect the bigger and better company we have become.

Complex made simple

Steer Davies Gleave has become Steer.

In our 40th year, we look ahead to exciting times as our company changes its name and identity to mark our continuing growth and diversity as a business.

With a growing presence across the globe and a broadening portfolio into sectors beyond transportation – including health, power and economic development – Steer has evolved to meet new demands, new ideas and new technologies. Transportation remains at the core of our business, but we have broadened to help our clients maximize opportunity and realize value within this changing landscape.

Some things haven't changed though. We continue to embrace our legacy of providing objective and results-driven advice. We are still truly impartial, with no external stakeholders, and remain wholly dedicated to providing clients with smart-thinking, grounded in expertise.

Steer is a firm of specialists – combining strategists, researchers, analysts, economists, planners, designers, engineers and technologists – based in 21 offices across four continents. We are driven by our passion to provide answers that help people, places and economies thrive.

Complex questions. Powerful answers.

Find out more at steergroup.com

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Welcome

Welcome to our landmark edition of *The Review* in which we share that we have become Steer, celebrate being 40 and provide our usual insights and perspectives.

This issue features a strong cross-cutting theme of change and evolution, whether it be in relation to new technologies, shifts in policy or the impacts of major projects on economies and communities (plus our own exciting changes).

It is from time-to-time tempting to highlight change as being atypical but from our 40 years of working for and alongside clients we have seen, first-hand, that this dynamism is not a temporary or new phenomena but has been and will remain an ever present characteristic; transportation, cities and infrastructure are by their nature inherently dynamic.

Our commitment to innovation, rigor, expertise and impartiality have been with us from our earliest days to the current moment, allowing us to continuously evolve and serve our clients. While we have changed our name, our commitment to our clients and to our inherent qualities is undiminished as we look forward to another 40 years of service.

Hugh Jones
CEO

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New faces



Michael Colella
Associate Director

Michael joins our New York office, transferring from the U.K. He brings 20 years of experience in commercial, economic and planning work for clients around the world. With experience in both public and private sectors, planning, strategy and major projects, Michael has extensive practice understanding clients' needs and developing realistic, practical solutions which can secure senior management approval and stakeholder buy-in.



Darrell Smith
Associate

Darrell joins our Boston office, bringing transportation planning experience across a variety of modes including high-speed and intercity rail, bus, transit and paratransit. With over 15 years of experience working for national and regional transportation planning agencies, Darrell has a strong understanding of route and service planning, forecasting financial performance, and general transit operations planning.



Alasdair Dawson
Associate

Alasdair joins our U.S. business, transferring from the U.K. He brings 15 years of experience managing and facilitating multi-disciplinary projects and programs around the world to gain a collective understanding of project interdependencies and help sponsors make informed decisions.



Ian Sample
Principal Consultant

Ian joins our Boston office as the newest member to our North American Aviation team. Ian brings extensive experience in airport strategic planning, commercial forecasting and financial modeling.



Christina Lindsey
Principal Consultant

Christina joins our Vancouver office, transferring from the U.K. She is an experienced project manager and planner who enthusiastically works with multi-disciplinary teams to deliver sound advice that supports clients on complex transportation systems and planning applications.



Richard Harper
Associate Director

Richard joins our U.K. Advisory team in London as an Associate Director. Richard has a wide variety of transportation business development experience gained over 25 years. He has worked on the delivery of rail infrastructure enhancement, and the development and launch of an open access rail service. Recently, he led business transformation plans as part of successful rail franchise bids.



Helen Waters
Associate Director

Helen brings significant industry knowledge, predominantly in the rail sector, continuous improvement and innovation. She has a track record of defining and delivering improvements in operational performance and safety within a challenging operating environment and working closely with a wide range of clients and suppliers.

Consultants

Shou Wang joins our Boston office; Angie Ning, Jose Ongpin, Fiona Laird and David Kopulos join our Toronto office; Julia Wean joins our Los Angeles office; Lindsey Bullen and Prachi Vakharia join our Washington D.C. office.

Looking to move?

If you are considering your future and are looking for somewhere to make a real difference, Steer has much to offer. Our firm continues to grow in North America and throughout the world. To find out about current opportunities, visit our website: steergroup.com/careers

Company updates



Jenny Hong and Elisa Tejedor in our Los Angeles office.

Steer opens two new offices

We are delighted to announce the opening of two new offices in Brussels and Panama.

Brussels joins our offices in mainland Europe, including Madrid, Bologna and Rome, that will continue to serve our global investor client base and the work we undertake for the European Commission and the European Parliament. We have advised and presented to the European Parliament on night trains on the Belt and Road Initiative (BRI) and we continue with influential studies of the liberalization of transportation networks such as the Fourth Rail package, road and bus transportation services across Europe.

Our new office in Panama opens after years of working on projects in the country. The office has already secured important projects including a proposal for the design of a nomenclature system for Panama and San Miguelito's streets, the integration of the local bus service with the Metro Line 2 and a project for promoting priority bus lanes for the public transportation system in Panama City. The country has important mobility and accessibility needs and we plan to continue supporting both the government and private clients.

Steer turns 40!

This year we are excited to celebrate our 40th year providing expert advice, international insight, and technical innovation! It all began in 1978 when three good friends – Jim Steer, John Davies and Graham Gleave – started a transportation planning firm called Steer Davies Gleave, now Steer, and opened our first office in Covent Garden, London. Steer expanded globally in the late to mid-90s by opening offices in San Juan, Santiago, Madrid and Bologna. By the mid-2000s, we had grown to over 300 staff and opened offices in North America.

Today we have over 450 staff worldwide, spanning Europe, North America, Latin America and India. Steer's nearly 80-person staff in the United States and Canada sit across offices in Boston, Los Angeles, New York, Toronto, Vancouver and Washington D.C. Our work today embraces all modes of transportation to provide our clients with strategic advice underpinned by technical excellence and expert opinion. We combine commercial, economic, technical and planning expertise to find powerful answers to our clients' complex transportation challenges. Answers that help people, places and economies thrive.



Stephen Gardner from Amtrak speaks at Movement Matters.

Movement Matters: a burst of fresh thinking

Movement Matters is a series of inspirational seminars, debates and workshops, presented by Steer, exploring how transportation shapes and influences places, people and economies.

Drawing on experience from international leaders in transportation, government and related industries, we share insights and debate opportunities and challenges. Visit steerMM.com for more details on upcoming sessions.



Transportation demand management using a personalized approach

By Tony Duckenfield and Lisa Buchanan

The desire to reduce single occupancy vehicle trips is an increasing trend across many parts of the world, including the U.S., and we have been exploring the best ways to achieve transportation behavior change to support this goal. One of the approaches we've had particular success with is Personalized Travel Planning and in the last year or so, we've been able to demonstrate that this approach can be highly effective in a U.S. context where other ways of reaching out to communities have predominated.

Personalized Travel Planning

Personalized Travel Planning is an outreach approach based on a face-to-face conversation between a trained Travel Advisor and an individual resident, employee or visitor. Within these conversations Steer uses a Motivational Interviewing technique originally developed in the health sector that we have pioneered in the transportation sector over the past 10 years. This technique involves listening to the individual's needs, wants and constraints and guiding them towards a solution involving more active and environmentally friendly transportation choices.

These conversations are backed up by resources such as maps, 'how to guides' and information about transit services or bike routes. Ideally, they are also complemented by a digital communications strategy and wider community activities. Our approach has been developed over more than two decades from projects undertaken around the world. It recognizes that:

- Simply providing information is not enough to substantially influence travel behavior, most of which is ingrained into habitual patterns – it is also essential to untap underlying motivations for change, and then to support the process of change, which often involves something untried and unfamiliar.
- Every community is different and has its own opportunities and constraints, and within each community, individual circumstances and attitudes also vary – here, the face-to-face approach pays dividends since a skilled Travel Advisor can modify their approach 'on the fly' and in response to feedback they receive in real time during the conversation.

- While personalization is a vital component, common themes often emerge so Travel Advisors can be armed with the training and supporting material they need.
- Since local knowledge and an understanding of the local community is extremely helpful, where possible, Travel Advisors are recruited locally and then undergo a rigorous training program. This has the added benefit of providing a positive legacy for any Personalized Travel Planning program.

The collection of monitoring and customer satisfaction data is built into the Personalized Travel Planning process so that there is learning during the course of each project and from one project to the next.

Success stories

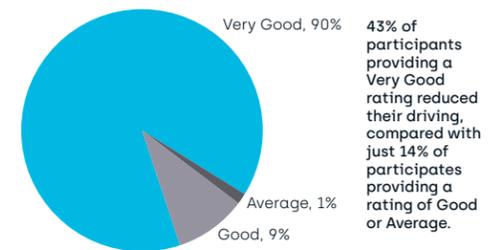
Using monitoring data, and with permission of our clients who appreciate the value of sharing good practice, we have undertaken a review and summarized the headline findings of five recent Personalized Travel Planning programs:

- Green Lake In Motion for King County Metro.
- City of Issaquah 'Salmon Friendly Trips' for King County Metro & City of Issaquah.
- Puyallup In Motion for Pierce County Planning and Public Works.
- Cruz511 In Your Neighborhood for Santa Cruz County Regional Transportation Commission, [SCCRTC].
- Pleasanton Smart Trips Livermore Amador Valley Transit Authority [LAVTA or Wheels Bus].

Overall, across these projects there was a 12% reduction in drive alone trips and an 8% decrease in drive alone mode share, along with corresponding increases in the mode share for more active and sustainable modes such as transit, walking, biking and carpooling.

Our review of these programs has provided valuable lessons which we can apply to future programs. For example, one of the key factors behind the success of these programs is the positive

Figure 1: Satisfaction with Travel Advisor



experience for participants who seemed to enjoy the face-to-face interaction, and value the information and advice. The importance of this is demonstrated by the finding that when the participant rated the helpfulness and courtesy of the Travel Advisor as 'very good', they were around three times as likely to reduce their drive alone trips compared with when they were rated as 'average' or 'good'. This effect is illustrated in Figure 1 which compares the proportions of participants reducing their driving by level of satisfaction with the helpfulness of the Travel Advisor.

This finding has implications for how Travel Advisors are recruited and trained, and how they are supported through the course of a program so they can continue to come across as both knowledgeable and friendly.

More generally, we have found that the barriers to sustainable modes of transportation and ways of overcoming them are entirely consistent with the principles of Behavioral Economics and what is sometimes called 'Nudge Theory'. This is helpful when planning new programs since the likelihood of success can be increased by drawing on the wealth of literature from this field.



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Lessons from Japan

By Patrick Miller

In North America, best practices for urban and regional transportation are often drawn from Europe. While cities like London, Paris, and Copenhagen can be used as examples of successful transportation planning, delivery and operations, there is also an opportunity to look at lessons from cities such as Tokyo, Osaka and Fukuoka.

In Japan, whether traveling to work or across the country for vacation, rail and transit play a critical role in keeping people moving. At a national level, over 30% of all passenger kilometers traveled make use of rail or rapid transit – which is significant compared to other nations such as Germany or the United Kingdom where this share is approximately 10%. In some regions the share of trips on rail and transit can exceed 50%, with automobiles being used for under 20% of trips.

Often, Japan's success in growing a robust rail transportation market are attributed solely to the scale and density of its cities. However, many North American cities (including those with over 4,000 people/km² such as Vancouver, New York, Toronto, Boston and Montreal) have densities similar to denser urban areas in Japan. Rather than density, North America can focus on two areas to learn from Japanese transportation: land use and transportation integration, and seamless customer experience.

In Japan, both public and private transportation providers contribute to planning, financing and delivering urban developments. As a result, many station facilities are integrated into surrounding land uses ranging from mixed use development and shopping/office centers in 'core areas' to malls, condominiums, or housing developments in more suburban or rural areas. Private operators may directly finance and deliver these developments, while public agencies may focus on regulatory or policy measures – such as transferring air rights to private developers in exchange for financial contributions to the development and operation of a railway or subway.

Japanese transportation providers realize two types of financial benefit from playing an active role in land development: increased development at stations drives demand on transportation services, yielding higher ridership and revenue; and station integrated commercial and residential developments are easier to access, which in turn increases commercial activity and property values



– creating significant financial returns for transportation companies from 'non transportation' businesses, which in turn allows for further expansion or improvement to the transportation system.

These two benefits create a 'virtuous cycle', wherein providers can use transportation services to unlock increased development potential (increasing revenues), expand their developments to increase demand on particular services (improving revenues relative to operating costs), or utilize increased revenues to improve their transportation offering and expand into new markets. This stands in contrast to North America where most transportation agencies or service providers do not play a strong role in land development outside of policy formulation.

Customer experience is another key factor in attracting and retaining travelers. A degree of standardization across the country supports travelers in using transit for a range of trips. Like North America, in Japan there are multiple service providers across the country acting at national, regional, and municipal levels. Unlike North America, effort has been made in Japan to standardize customer experience across providers. For example, agreements have been put in place to ensure that each operator's fare card can be used on any other operator that makes use of fare cards. This means a customer can buy a fare card for JR East in Tokyo and

use the same card in Fukuoka nearly 1,000 km away – hassle free. Each card has one account that can be loaded on any fare card equipped operator's fare system. The system subtracts funds from this account and allocates revenue to each operator a traveler uses to make a trip. To further enhance customer experience, multiple trip planning tools are available to help travelers determine their fare and the services they need to use in advance. This focus on ease of use allows customers to choose the best combination of services and trust they will pay the correct fare.

Many North American regions are in the midst of a rail-renaissance, with billions of dollars of proposed investment into transformational programs, such as Los Angeles' Measure M investment program, expanding the GO Rail network in Toronto, and Réseau électrique métropolitain in Montreal. As rail investment continues, applying lessons learned from strong global comparators, including those in Japan alongside those more typically drawn from Europe, will support successful planning, delivery, and operations and ultimately, passenger market development.



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New York City's ferry renaissance

By Pierre Vilain



New York Harbor is home to the country's largest passenger ferry network, and it is expanding far more rapidly than either regional population or the rest of the transit system. Most of the growth has been due to the phenomenal expansion of the New York City Ferry Service, which has inaugurated several new routes within the last year, more than doubling its ridership.

New York City Ferry is controlled by the City itself, and its bold move to reduce fares to equal the \$2.75 subway or bus fare has greatly expanded the role of passenger ferries in the harbor: While it still provides a reliable and enjoyable commuting option, it is also increasingly serving tourists and residents. As was evidenced this past summer, the ferries have been instrumental in greatly increasing visitation to waterfront destinations such as Rockaway Beach, Brooklyn Bridge Park and Governor's Island.

Anyone who has not visited New York Harbor since the 1990s would hardly recognize the harbor today, with a constant stream of vessels and passengers accessing the various leisure and cultural attractions now efficiently served by waterborne transportation.

Steer has been advising the City on its strategy for passenger ferries since 2013. We are currently part of a team that will work with New York City over the next five years to define a plan for further ferry expansion as well as manage the demands of its current routes. It is rare that a transit system more than doubles its patronage within two years, but that is effectively the current situation facing New York City with its ferry system.

The other component of the passenger network controlled by New York City is the Staten Island Ferry. The venerable service continues to be the primary transit option between Staten Island and Lower Manhattan, and New York City. Recently the City requested Steer to assess the potential ridership and economic benefits that would be expected if an additional service to Midtown Manhattan was also provided. Whether the Midtown service will be implemented is uncertain at this stage, but the initiative exemplifies how passenger ferries are seen as an answer to some of New York City's pressing transit needs.

The remaining components of the ferry system on the Harbor include the

privately-run ferries linking New Jersey to Manhattan. This network was developed in the 1980s and 1990s, and is itself extremely successful, transporting over 30,000 daily riders without the benefit of any public operating subsidy.

In a time where the region's transit system has experienced some notable challenges, the ferries have been an evident bright spot, certainly in terms of traveler perception and experience. The desire to expand waterborne transportation is certainly not restricted to New York City, however, and includes planning initiatives in Boston, Portland (Maine), Whatcom and Kitsap counties and Seattle (Washington) – all locations where Steer is currently playing important advisory roles for passenger ferry operators.



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Understanding the transit ecosystem: where to innovate

By Katasi Kulubya and Mary Riemer

When we think about technological innovation in the current transit market, what comes to mind? Disruption of transit as we know it? Perhaps instead of conflict, we should think more along the lines of technology sustaining and enhancing public transportation. To do that, we must understand the entire transit ecosystem and where incremental opportunities lie.

The transit ecosystem has two sides – the internal operations of the transit provider and the user experience the customers have with the transit system itself. These two sides are powered by separate sets of individuals and therefore both perspectives need to be considered when developing an optimal ecosystem.

Today, most transit technological innovation are developed from the customer's point of view, aimed at improving the transit customer journey. Rider-centric transit websites, complete with accurate schedules, trip planning tools, and real-time service alerts and arrival times, are one clear example. Riders also have access to a wide range of mobile transit apps, such as CityMapper, Transit and Google Maps, available to them as consistent sources of travel information. Yet transit agencies nationwide are faced with declining ridership, a shrinking operational workforce, and outdated workflow processes which lead to poor communication, poor data collection, and other day-to-day challenges. How might an approach that focuses on technological innovation within transit operations also improve the customers' experience?

A front-end user interface, like CityMapper or Google Maps, alone won't ensure the success of a system, since the end-result relies heavily on the operational aspects unbeknownst

to the user. Therefore, if we continue to innovate with only the customer in mind we may never achieve the profound transit evolution we envision.

Technological innovations that improve the customer experience are often the result of an User Experience [UX] approach which involves human-centered research and iterative testing to create solutions that are accessible, usable and meaningful. However, the same principles can also be applied to improve backend transit operations.

First, we must understand the UX approach which includes four key components:

- Discovery (observe behavior, gather user insight).
- Design (generate ideas, build prototypes).
- Test / Iterate (test prototypes, amend ideas).
- Develop (implement tested ideas, measure success, learn).

In the discovery phase, we would determine areas of improvement to transit operations after studying day-to-day workflows of individuals within different departments. We would work to understand their goals, needs, and frustrations within those work experiences. In other words, we would seek to measure the health of three components:

- Quality of Process (task completion, time, and risk).
- Quality of Data and Information (how it is collected, transferred, and managed).
- Quality of Communication (with key staff, stakeholders, partners, and suppliers).

Next, we would identify potential solutions and design models to test each one. These models can be a prototype of a product (e.g. a new transit data management software) or a prototype of a strategy (e.g. a new collaborative transit workflow). Finally, we would test these prototypes in a controlled environment with a selected group of transit operator participants, make adjustments based on the insights gathered and ultimately develop the final solution.

Utilizing a UX approach, we can examine a variety of applications that streamline transit operations to enhance the service provided, and ultimately elevate the transit customers' experience. To utilize this approach, agencies and municipalities should start with two easy principles – respect the old, self-reflect for the new; and show current vs. projected cost/benefit. Starting the process with a 'cultural' examination to better understand the organization's strengths and weaknesses before taking on any major changes allows the organization to position itself in the best way possible for innovation to happen. Comparative cost/benefit metrics can effectively help agencies see value in proposed changes to their operations, motivating leaders to adopt new processes that potentially move away from traditional workflows and models.

This approach can harness technological advancements to improve transit services, rather than disrupt them and help providers holistically understand where opportunities lie across the entire transit ecosystem.



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Reconnecting Toronto: the PATH and TO360 network

By Phil Berzcuk and James Brown

Toronto PATH is the world's largest underground retail complex. Located in Toronto's downtown core, the PATH connects over 75 buildings and 40 km of retail frontage in an underground labyrinth of pedestrian walkways and spaces. The network experiences over 200,000 business-day commuters and thousands of additional tourists, visitors and residents; and, with over \$1.7 billion in annual sales, provides an invaluable contribution to the city's economic viability.

A recent independent study quantified that for every 1% increase in regular PATH users, annual sales revenues would increase by \$17 million and identified pedestrian wayfinding as one of the network's principal needs.

Navigating the PATH can be challenging for visitors, who are frequently too intimidated to try to navigate the network or get lost due to an outdated wayfinding system and regular expansion to the network. This results in a poor user experience and limits customers' ability to fully explore the retail network. One key opportunity to help capture this untapped revenue lies in revamping the wayfinding system to deliver clear and consistent information where and when customers need it, building confidence to explore the PATH.

In 2015, Steer set out to do just that. Commissioned by the Toronto Financial District Business Improvement Area (BIA), in partnership with the City of Toronto, we developed a new user-centered PATH wayfinding system.

The new system is constructed around connector routes – continuous paths that allow users to navigate the entirety of the network – joining transportation hubs like Union Station to major destinations such as Yonge-Dundas Square and revealing branch routes with retail and other

amenities located off the connectors. The new system utilizes wall map panels to be installed network-wide and directional signage content that can function stand-alone or be integrated with existing wayfinding systems managed by the individual property owners, to deliver clear directions and more accurate representations of buildings consistently, regardless of ownership.

Digital

Our work also delivered high-level functional requirements for a future digital wayfinding service to deliver 'Eyes-Up' navigation that will improve the PATH experience for all user types, including mobility and visually impaired visitors to the network. Based on the use of Bluetooth beacons, the system will deliver location specific, dynamic A to B navigation that can be stand-alone and/or integrated with existing business websites and applications.

TO360 multi-modal wayfinding

The PATH system also focuses on getting people to, and drawing people from, major landmarks and neighborhoods at street level by linking it with Toronto's TO360 pedestrian wayfinding system that Steer has been working on since 2011.

The TO360 wayfinding strategy supports walking as the primary mode of travel to unlock multi-modal transportation in the city – providing consistent information across modes and environments through a unified signage and mapping system delivered by the City of Toronto and project partners.

Following extensive stakeholder and public outreach, a pilot project was implemented in June 2015 in the City's Financial District. The pilot project consisted of on-street signs, new maps

at transit shelters, and updated maps on existing transit shelters and information pillars. Signs were installed on the most important pedestrian routes connecting arrival points and local destinations, but were also designed to reveal the area's attractions and encourage exploration. Maps incorporated features such as 'heads-up mapping' oriented in the direction the user is facing, a 5-minute walk circle, landmark buildings and key destinations.

An outline business case, completed in 2012, evaluated the expected benefits of the wayfinding system and paved the way for the pilot. Its findings were further qualified by an independent evaluation of the pilot post-implementation, which determined that for every dollar invested, almost four dollars, will be returned in transportation benefits over the 25-year life cycle of the project.

Integrating the two systems enhances the user experience across environments, encouraging people to explore and get lost above and below ground, while having the confidence that there will always be information nearby to help them find their way.

Steer is currently supporting the City to roll-out TO360 city-wide and in April 2018, the system-wide roll-out of the PATH wayfinding network will be launched. Once complete, the two systems will seamlessly work together to provide a more integrated, friendly and ultimately enjoyable experience for people navigating the capital of Ontario both above and below ground.



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News in brief

WeHo Smart City Strategic Plan

The City of West Hollywood in California has recently developed the WeHo Smart City Strategic Plan to comprehensively integrate data and new technology into the city to enhance the urban experience. The Plan seeks to improve the city by addressing challenges and opportunities in sustainability, mobility, accessibility, resiliency and transparency.

Steer is part of a team comprised of CityFi, SOM and Iteris that led the study in partnership with the City. Steer provided mobility user experience support, including workshop facilitation and strategy writing.

The Plan developed three main strategies for city operations to integrate data and new technologies across various departments and initiatives. They include:

1. Create a culture of data as a smart city hall ready for the future.
2. Collaborate and experiment across departments to do more with less.
3. Automate processes for an exceptional customer experience.

The vision for mobility is to create a multi-modal, well-connected community where residents can seamlessly reach destinations by a variety of mobility options. Data utilization and responsive public services strategies are suggested to accommodate for an autonomous and shared future. Recommendations include establishing a mobility data management program, expanding the curbside management pilot, adopting a data sharing policy and developing tools to make it easier for travelers to access mobility data and exploring an on-demand transit pilot.

Learn more about the plan at:
wehosmartcity.org



Building healthy places through connectivity

By Sarah McMinimy

We often speak about connectivity as a key function of healthy places and its importance to walkability, but how can we meaningfully demonstrate how an existing barrier or a proposed project impacts connectivity?

To imagine the spatial concept of connectivity in everyday life, take the perspective of a person standing on a given segment of street within a wider network of streets. How directly can you access any given point within the street network? Do you have multiple direct route options? Or limited and circuitous paths? Could you throw a stone to your desired destination, but must instead walk a half mile to a safe crossing?

Connectivity is a concept that is easy to feel; we feel it in the form of frustration, or the reverse, in the satisfaction of a shortcut in a familiar space. But being able to quantify and visualize connectivity, poor or improved, and its impact on communities can be a powerful tool to understand a place, inform decision-making and tell a story of project impact.

By measuring the relationship of a street segment to other streets in its network of proximity, the connectivity analysis provides a quantification of the ease and ability for a person on any given street segment to access locations on nearby streets. This is represented visually as a connectivity "heat map" where areas in red are the most connected and areas in dark blue are the least.

Steer recently used this tool to identify gaps and evaluate the impact of adding crossings on arterials in La Habra, California.

In the connectivity analysis of existing conditions, arterials appeared to be a significant barrier, with level of connectivity shifting dramatically from one side of an arterial to the next. Connectivity was found to be highest within the grid in the center of the city, while the bordering neighborhoods with

limited access points and circuitous streets tended to have poorer connectivity.

Following the identification of arterials as key barriers to connectivity, 80 test crossings were added in this model in locations and frequencies that aligned with local context, the city's bicycle master plan, traffic volumes and locations of key destinations such as schools and parks.

The impact of new crossings is starkly portrayed in the connectivity heat map. Connectivity within the core center of the city is most dramatically improved, where vast areas are shown to have high connectivity compared to only a few streets before. An added multi-use trail along a lightly used railroad right-of-way transforms a former barrier into a connection between north and south.

The dramatic impact of crossings in the core grid is contrasted by the milder improvements on connectivity for hillside and walled-off communities; indicating these neighborhoods are not only limited by the arterials but also by their own form. Addressing long-term connectivity through development standards is a takeaway raised by this contrast in impact.

Ensuring that street design responds and is sensitive to real world conditions is important for improving connectivity in a way that is meaningful and truly safe for pedestrians. While the results of the analysis point to a very exciting outcome of improving connectivity across arterials, some key considerations that are not captured in the analysis must be taken into account:

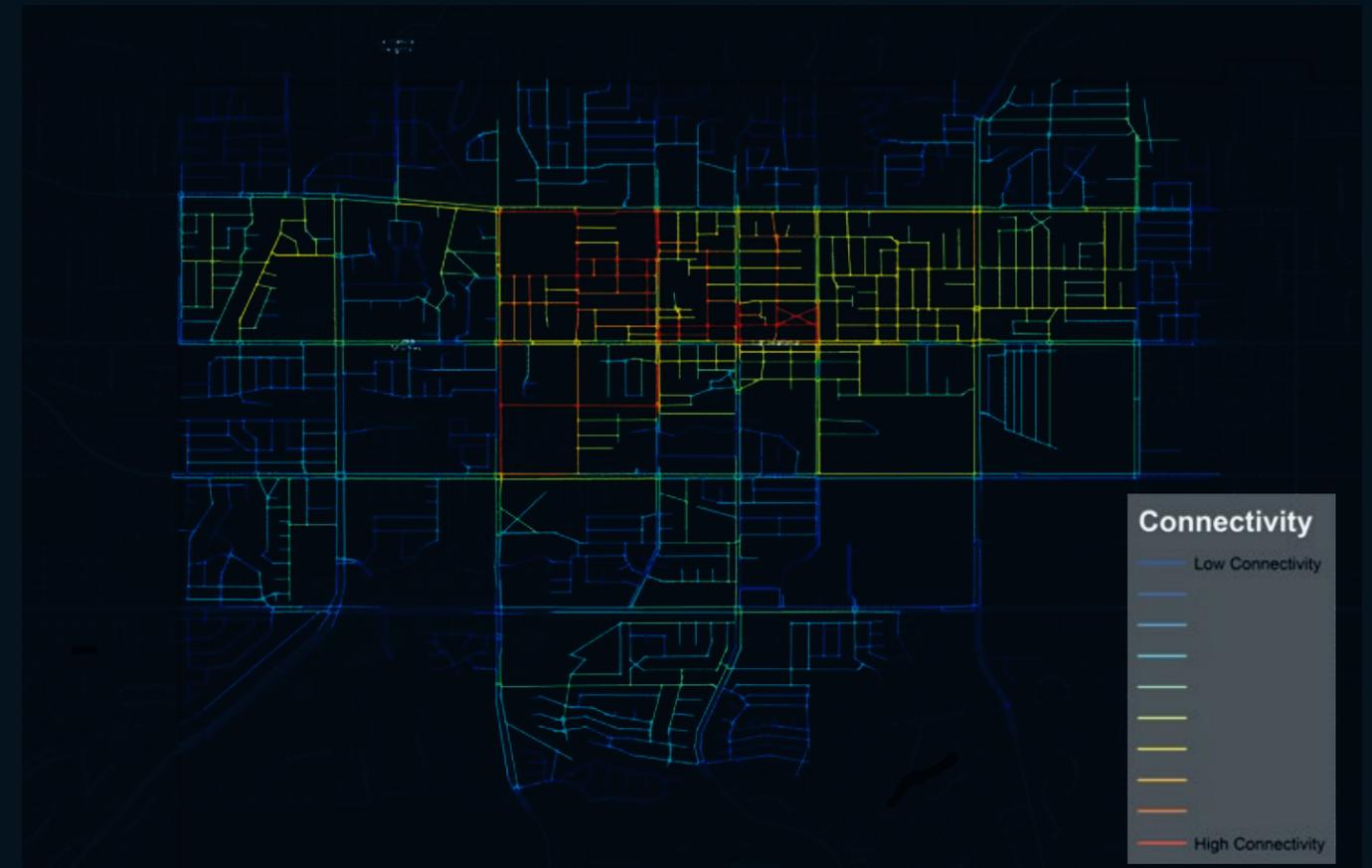
- The dramatic improvements to connectivity are achieved with the implementation of crossing projects as a network, rather than implementing a crossing in isolation.
- Ensuring safe design appropriate for street context, volumes and speeds, visibility and lighting is essential.

The analysis results clearly link projects to improved connectivity, but how do these results translate into real value for communities?

- **Safe and inclusive streets:** When the streets are designed to be safe and accessible by taking into account users of all ages and abilities they are better for everyone. Barriers to connectivity impact users with different levels of magnitude.
- **Healthy communities:** Creating environments that encourage walking and biking, and that help residents connect to other areas of their community without needing to get in their car, can improve physical and mental wellbeing.
- **Good for local businesses:** Particularly for small businesses, being located on a walkable street that is connected to the surrounding community can help businesses connect with customers.
- **From isolated to integrated:** Busy arterials with many lanes and infrequent crossing points create significant barriers between different neighborhoods, places of business, parks, schools and other destinations. Improving these connections is important to supporting a thriving community.
- **Travel behavior:** Connectivity plays closely into choice; both in terms of determining the route options that can be chosen, and in turn, by influencing the means by which an individual chooses to get there. By playing an important role in transportation decision making, connectivity also influences travel habits, and ultimately long-term travel behavior.



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Existing conditions



Impact of proposed changes

Turning airport parking upside down in the age of Uber

By Stephen Van Beek

Across many North American airports, executives and board members are pleased with the increases in passengers moving through their airports. Airlines are flying new and larger aircraft to new destinations, opening the world of business and leisure to their local communities. Aeronautical revenue tied to passenger growth is financing operations, helping fund the new capacity required by the growth, and improving balance sheets.

At many of these same airports, however, revenue growth in parking – traditionally the largest source of non-aeronautical airport revenues – is lagging far behind growth in traffic and aeronautical revenues. Several reasons are typically offered for airports' loss of market share to other modes and access models: competition from off-airport parking providers; growth of Transportation Network Companies (TNCs) or ride-hailing companies, such as Uber; and decline of vehicle use by millennials and others. Many worry in the next decade that Autonomous Vehicles may further reduce airports' market shares of trips to their airports.

As these trends take a bite out of airports' market shares and revenues, airport executives are increasingly realizing that the old days of building garages costing millions of dollars, pricing them at daily rates and expecting customers to fill them, are over. This 'supply-side' strategy is expensive, results in low utilization especially during the 'shoulders' (Monday and Friday) and off-peak (Saturday and Sunday), and costs airports revenue.

Today, Steer is working at several U.S. airports and with our international partners to focus on the demand side of the parking equation. Borrowing concepts used by airlines and hotels, we are increasing market share and revenue for airports. The components of our strategic offer include:

- **Pre-booking:** Airport customers receive a discount for reserving parking spots in advance, providing certainty that a spot and service is available when they begin and end their journey. 'Roll-up' rates paid by customers not pre-booking should be the highest rates for individual parking products.
- **Revised product offerings:** Many airport parking products are not branded effectively and are limited



to premium and economy parking. Airport competitors often provide better service at lower prices.

- **Valet:** Underutilized at most airports, especially for longer stays. Valet is often overpriced, resulting in few long-term stays where the benefit to the airport is the greatest (i.e., freeing up other scarce spots that can be turned over multiple times).
- **Transaction pricing:** Pricing the individual customer stay enables the airport to discount the shoulders and off-peak times to ensure that utilization is steady across the week. The same business travelers willing to pay \$35-\$50 daily rates mid-week will not pay those daily rates on a one-week trip with their family.

Enabling this strategy requires that airports replace outdated equipment and software which is incapable of accommodating dynamic pricing and does not yield the data analytics necessary for employing yield management. We advise airports on procurements for revenue control and prebook systems that work together to provide the necessary tools for effective demand-side parking management.

Once the tools are in place, we work with either the airport itself or the

airport's outside operator to ensure effective implementation. For outside firms, this includes service-level measures, which help to determine the annual fee paid by the airport to the parking operator and/or the outside entity providing the yield management expertise.

With the ubiquity of smart phones and e-commerce, a vital component is for airports to build distribution partnerships and channels where their parking is sold – with airlines and other partners, and through airport websites. This requires most airports to greatly expand their customer relationship management (CRM) database and capabilities, effectively building the airport as the preferred channel for selling parking and communicating to customers about discounts and other incentives to park at the airport.

The results have been impressive: Even before pre-booking was implemented, the recent rate recommendations we made for one large hub airport will result in millions of dollars in additional revenue.



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Bike share evolution: impacts on your city

By Geoff England, Jenny Hong and Rachel Forseth



Advancements in shared economy and technology are changing modern bike share as we know it. Dockless bike share operators such as LimeBike, MoBike, Ofo, Spin, and Jump have entered the U.S. market and are rapidly expanding to new cities throughout the country.

In many cases funded by venture capital, these companies can introduce bike share systems at no cost to municipalities, when compared to traditional docked systems, and can quickly mobilize in new locations with short notice. While most existing dockless bike share operators offer traditional bikes, the product offering has evolved recently to include electric bikes and low-speed electric scooters, which will greatly expand the range of options for commuters, especially supporting first/last mile connections. The dockless model offers many advantages such as no physical infrastructure costs of stations associated with docked systems, improved access through mobile apps, and significantly larger fleets resulting in more, easier to access bikes. Alternatively, it presents new challenges such as less municipal control over where riders return bikes, more bikes than available bike parking, more difficulty ensuring safety and maintenance standards, and less ownership and access to valuable user data. As dockless bike share continues to expand and innovate at a rapid pace,

cities are left with finding a solution to balance the pros and cons of this new bike share model.

Cities must not only embrace change, but prepare to guide and regulate it in a manner that serves the public's interest while encouraging, not stifling, innovation. As dockless bike share and other emerging technologies disrupt existing transportation models, cities need to account for industry advancements in their short- and long-term strategic planning. While operators continue to improve the delivery of their services, cities should be prioritizing clear and streamlined regulations, assertive data-sharing requirements to support transportation planning, and urban design that incorporates flexible spaces for bike parking.

Steer has worked worldwide with bike share operators and municipalities on a variety of projects ranging from strategic planning to demand analyses and evaluation since 2008, including most recently with Ride On in Miami-Dade County, Florida and the San Diego Association of Governments (SANDAG) in California.



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News in brief

Transform 66 - Outside the Beltway
Financial close was reached in late 2017 for the Transform 66 - Outside the Beltway Project in Northern Virginia. This P3 project between Virginia DOT and Express Mobility Partners (EMP), comprised of Cintra, Meridiam, APG, and John Laing, will add high occupancy tolled express lanes to a 22.5-mile corridor west of the Washington D.C. Beltway. The P3 is taking the form of design, build, finance, operate, and maintain over a 50-year concession period.

Steer served as the traffic advisor to EMP. In this role, we developed a managed lane forecasting model to produce the traffic and revenue forecasts that were used in the plan of finance. Our model used observed behaviors of travelers from other operational managed lane projects to reflect the range of behaviors of travelers, including under urgent situations. We presented our forecasts to the lenders, rating agencies, and the Transportation Infrastructure Finance and Innovation Act (TIFIA).

The project is a great success for Virginia, with their private partner both delivering the \$2 billion project and paying a substantial concession fee that includes an upfront payment over \$500 million. In addition to the equity investment, the financing of the project involves Private Activity Bonds and a \$1.2 billion TIFIA loan. Concession fees will be used to fund additional multimodal improvements in the corridor.

Final design process is underway and the project is expected to be operational in 2022.





Gardiner Expressway

Is there a case for disinvestment business cases?

By Leslie Buckman

As funding becomes tighter and government priorities expand, business cases have become more important in the field of transportation planning to set out the rationale and case for investment in a project. They demonstrate that the benefits of the project outweigh its costs. However, changes in policy and demand levels mean that some existing infrastructure would not be implemented were the investment considered today. As such infrastructure becomes life expired, a business case should be developed to inform the merit of investing in its long-term maintenance and continued operation.

Business cases are typically used to justify investment in new build transportation projects to provide an improved network or user experience. With an initial focus in transportation economics, business cases have expanded to capture the whole why and how of such investments, covering the gamut of the strategic rationale of the project, the societal impact, how it will be paid for, and how it will be delivered. The business case is used to inform decision making, both as the project evolves [to optimize project definition] and then the final decision on project implementation.

The projects being evaluated are normally proposed as a way to improve the transportation system: adding capacity, serving new markets, improving the service offer, enhancing the customer experience. However, a business case is grounded in the contemporary policy and cultural context, which invariably changes over time. The immediate post-war period saw the automobile become the principal focus of transportation planning, culminating in the interstate network in the U.S., the burgeoning motorway network in the U.K., and equivalent freeway networks across much of the western world,

resulting in a diminished role for transit, with many urban transit and intercity rail services hollowed out.

However, in the last decade or two, such an approach is undergoing a degree of reversal. The environmental and social impacts of focusing on roads at the detriment of transit has come under increasing scrutiny and the ongoing costs of maintaining the network are becoming increasingly problematic. The current focus has turned to improving transit, making walking and cycling more attractive, increasing land use density to reduce the need for travel, and encouraging more sustainable modes. In that light, some existing highway infrastructure does not fit into the current policy context and would likely not meet business case requirements if it were considered as a 'new project' today.

As much of the highway building boom occurred 40-60 years ago, the infrastructure is becoming life expired. To maintain the infrastructure, significant sums of money need to be expended, notably for bridges and elevated roadways which are both more susceptible to deterioration and more expensive to maintain and renew. For example, the 2017 Infrastructure Report Card by the American Institute of Civil Engineers report a \$543 billion backlog in repairing existing U.S. highways and bridges; the Turcot Interchange in Montreal, a three-level stacked freeway interchange, is being rebuilt at a cost of \$3.7 billion; and the City of Toronto will spend \$3.6 billion to rehabilitate the elevated Gardiner Expressway serving downtown Toronto.

Where the cost of maintenance and renewal is particularly high, a 'disinvestment business case' could be warranted to demonstrate the case for continuing to maintain the asset, as well

as the alternative of reducing continued investment or even removing the asset. This is essentially the opposite of a traditional business case, with cost savings set against the disbenefits of lower service levels, compared to the maintain option.

In the Gardiner Expressway example, a proposal was developed to remove the eastern part of the expressway, where traffic volumes are lower, and replace it with an at-grade boulevard, providing improved urban amenity and scope for new development. A 'hybrid' alternative was also developed that would rebuild the elevated expressway in a more northerly location, maintaining the road network but with reduced scope for urban amenity improvements and development. The maintain and hybrid options had comparable costs, but the remove option would have saved \$450 million, but added around three minutes travel time to automobile users. The City of Toronto undertook a comprehensive evaluation of the three options, with the Council voting to pursue the hybrid option.

In summary, any material expenditure for maintaining discrete elements of the transportation system should undergo a proportionate level of alternative options development and evaluation commensurate and consistent with projects to improve the transportation system. This will ensure the transportation system remains consistent with contemporary policy and fiscal requirements.

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2018 California State Rail Plan

By Stefan Reul

Steer is part of a consulting team that developed the 2018 State Rail Plan for the California State Department of Transportation (Caltrans). An extensive inventory of the existing rail services and infrastructure was conducted and provided the basis for the initial concept development. These initial concepts were designed to provide high quality rail service in the State of California and enable seamless door-to-door travel within the state.

After completion of the first phase of the Network Integration - Strategic Service Plan, Steer continued to support Caltrans as part of a larger consulting team to develop the State Rail Plan concepts and the evaluation of the ridership impacts and related economic impacts. Our responsibilities included support for the concept development, ridership analysis and the development of a customized market analysis tool that was used to evaluate high-level ridership impacts of proposed service plan concepts.

The State Rail Plan 2018 is the first of a new generation of rail plans with a focus on the strategic development of both passenger and freight rail services and infrastructure in a holistic way. Passenger rail is considered part of a system of mobility services and the rail service plan is one part of an overarching concept that includes integrated ticketing, travel information and first/last mile solutions to achieve seamless travel. Integration of all public transit modes including high-speed rail, intercity rail, regional and local passenger and commuter rail services, as well as BRT, LRT and bus transit services is essential to enable seamless travel options. Service plan principles that have been successfully deployed in Europe are the basis of the Rail Vision: Pulsed service (every half hour, every hour), symmetrical schedules (arrival and departure times between major hubs are symmetrical to the minute 0 on the clock face) and coordinated line speeds and related target travel times between transfer hubs (travel as fast as necessary, not as fast as possible) are pre-requisites for an optimized door-to-door travel experience.

In order to facilitate such significant improvements to public transit travel, a large amount of capital investment will be needed to provide infrastructure and rolling stock improvements for passenger rail. While the amount of investment



might seem overwhelming at first, it is important to understand that increases in population and economic activity will increase the demand of travel over time. Other travel modes such as highway or even air travel have existing capacity constraints that will likely not allow for significant future growth. Therefore, the investment into the rail system will enable growth and provide the needed capacity. In addition to the direct benefits for mobility in the state, there are also secondary economic impacts that will result from the investment and operation of the proposed Rail Vision Plan.

Steer analyzed and converted data to translate high-level strategic service plan definitions ('netgraphs') into data that can be coded into the ridership market analysis tool (RMAT). This model framework methodology that Steer developed reflects station and transfer conditions, as well as the proposed connectivity between different rail services and local access modes.

The market analysis tool is based on detailed model input data from a traditional demand model but uses the impedances and demand information to estimate rail market shares and ridership potentials using a simplified process. The tool is able to differentiate between coordinated and un-coordinated schedules and is sensitive to changes in service frequencies, reductions in travel time and travel time changes in competing air and car travel.

The analyses compared base year and outer year ridership for existing and proposed service plan concepts. The output was also used to gauge whether the supply and demand in various corridors are aligned or if there is the need to adjust services to achieve a balanced condition. The output of the ridership assignment process was utilized in benefit-cost evaluations and environmental benefit estimation of the rail vision. Findings and summaries of the analyses were discussed with stakeholders from rail operators and rail planning agencies to receive feedback and build consensus for the final service plan vision.

The Draft Rail Plan was recently published and feedback from the public is currently being solicited. The Final Rail Plan will be published later this year and will be the basis for a long-term strategy to develop the State Rail System according to the goals identified in the Plan. We are proud to be part of the team that supported Caltrans in the Rail Plan development to enable the State of California to achieve integrated mobility for passengers and freight in the short- and for long-term.



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A manifesto for cities' renaissance in the age of the driverless car

By Andrea Pavia and Craig Nelson

Connected Autonomous Vehicles (also known as CAVs) linked through big data in a shared economy will become, according to the latest industry predictions,^[1] a reality in U.S.' wealthiest urban environments within the next 10 years. What will be the face of the new city as a result of this change? How will this evolution unfold and how can administrators prepare?

The latest forecasts suggest that automation level 4 vehicles may be available for purchase within three years. This level of automation will allow CAVs "to perform all safety-critical driving functions and monitor roadway conditions for an entire trip"^[2] but will not cover every driving scenario. In such vehicles, however, drivers could devote part of the journey to sleeping or working on a laptop instead of driving. Level 5, full automation in all conditions, should be reached by 2030. Technology will not be the only determining factor, as issues related to CAVs will need to be addressed. This includes regulatory framework, insurance and the public's perception of literally putting people's lives in the hands of a robot. These challenges will be significant, but not unsurmountable, and when they will be resolved, we will witness the heralded transportation revolution.^[3] The pace of change in cities will then be astonishing, and could easily materialize in less than a generation, an incredibly short time in a city's life. Astonishing as well will be the change in our lifestyles.

In the coming years, urban population will keep increasing^[4] and CAV technology will disrupt the business as usual transportation model. These factors could turn cities into urban nightmares if cities don't prepare for it. Sprawling development, congestion, inequality, privacy, job-losses, and infrastructure rigidities will be among the most pressing challenges that cities' staff and policy makers will have to face through this passage. Preparing for CAVs will mean maximizing the benefits that they will offer while mitigating, if not eliminating, their risks; and particularly, the temptation of re-designing cities around the new technology rather than around their people, as a means to improve the quality of life of all urban dwellers.

One of the much-presaged benefits of the CAV revolution, apart from safety,^[5] will be more efficient traffic operations leading to increased carrying-capacity of existing road infrastructure and less



parking requirements, with the potential to reallocate road and parking space away from vehicles to other uses. With the ever-increasing levels of traffic congestion that urban environments will keep experiencing in the coming years, there will be a temptation to simply use the space 'gained' for more vehicles. This strategy would be short-lived, as we have seen many times in the past how more and bigger roads simply lead, rather quickly, to more vehicles on the roads.

We think that cities' staff and policy makers, instead, should take this opportunity to instigate a paradigm shift and break the cycle of motor vehicle dominance on U.S. streets. They should champion the reallocation of space away from automobiles, to more productive and resilient uses, people and human-scale activities, and finally break the perpetual circle of traffic-induced demand. With the advent of CAVs, cities' staff and policy makers will have the once-in-a-lifetime chance to re-consider how their streets function as part of a movement network, and a unique opportunity to use the 'extra space' to retrofit their cities in a more context-conscious and sustainable way.



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¹ A useful summary of the car automakers' plans as of 2017 is available at: Walker, Jon, "The Self-Driving Car Timeline - Predictions from the Top 11 Global Automakers," *techemergence*, last modified August 24, 2017. <https://www.techemergence.com/self-driving-car-timeline-themselves-top-11-automakers/>

² See the USA National Highway Traffic Safety Administration (NHTSA) for current market prediction: "Automated Vehicles for Safety," National Highway Traffic Safety Administration (NHTSA), accessed January 8, 2017. <https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety>

³ See Eno Center for Transportation for the current state of policies related to automated driving in USA: "Adopting and Adapting: States and Automated Vehicles," Eno Center for Transportation, June 1, 2017. <https://www.enotrans.org/etl-material/adopting-adapting-states-automated-vehicles/>

⁴ See in this regard the 2014 revision of the World Urbanization Prospects by UN DESA's Population: "World's population increasingly urban with more than half living in urban areas," United Nations, July 10, 2014. <http://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html>

⁵ According to NHTSA the safety benefits of automated vehicles will be paramount. Automated vehicles will have the potential to remove human error from the crash equation, which will help protect drivers and passengers, as well as bicyclists and pedestrians. Per NHTSA, as a reference, more than 35,092 people died in motor vehicle-related crashes in US in 2015. "Automated Vehicles for Safety," National Highway Traffic Safety Administration (NHTSA), accessed January 8, 2017. <https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety>

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