



*Linking Logic*



**Transport** - delivering productivity

## Turn mobility into competitive armoury



**A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker"**

Paul Krugman,  
The Age of  
Diminishing  
Expectations (1994)

It's time to reassess the economic relevance of our national transport assets. We must now focus on maximising the use of the most valuable networks and reconfigure big budget development to develop internationally-competitive armoury.

Markets are hungry to increase transport capacity in developed nations and improve mobility across the developing world to respond to opportunity before rival economies.<sup>1</sup>

Are nations investing in a transport system that will increase real productivity? Will markets visibly improve profitability? Will mobilising communities increase economic output? Will accessibility considerably enhance health and provision of skilled labour? What vision for transport should a nation follow?

These challenges are yet to be addressed by the transport productivity debate. This discussion paper helps to define the answers.

### Why competitiveness counts

Competitive nations explore the most efficient and effective way to deliver for customers first, because it offers better quality and more diverse opportunity to their people and industries in return. Simply, improved access to markets drives economic growth.

Switzerland, Sweden, Germany and Singapore dominate global competitiveness rankings, so it's no surprise they also house the world's most enviable transport systems. World-leading innovation, strong intellectual property protection, proactive technology adoption and labour market efficiency are key strengths in these countries.

Their savvy financial markets prioritise investment to the efficient movement of goods and services, world-class infrastructure and a skilled labour force resilient to change - core pillars of a successful, competitive nation.<sup>2</sup>



## The mobility mission

In the next three decades, an extra three billion people will demand mobility. Reciprocal capacity will need to be created in this time.

Despite short term global GDP deceleration<sup>3</sup> and a slow growth forecast for established economies,<sup>4</sup> global surface freight activity will increase by up to 3.5 times 2000 levels by 2050.<sup>5</sup>

Passenger transport volumes will also increase three to four times beyond 2000 levels to more than 70 trillion passenger kilometres per annum – particularly in urban areas where 6.3 billion people will live by 2050.<sup>5,6,7</sup>

## What will 2050 look like?



The United States (US) population will surpass 400 million.<sup>8</sup> Foreign trade will drive 50 percent of national GDP<sup>9</sup> and transportation demand (both passenger and freight) will double 2000 levels by 2020, tripling by 2050.<sup>10</sup>

China will be the world's number one economy (at 94 - 143 percent of the size of the US economy<sup>4</sup>) with 1.45 billion inhabitants.<sup>11</sup> It will accommodate a predicted 486-662 million highway vehicles, 44 million motorcycles and 28 million rural vehicles which is greater than today's worldwide car fleet.<sup>12</sup> The existing 1.4 million kilometre road network will grow to six million kilometres and the projected 100,000 kilometre rail network may have doubled.<sup>12</sup>

Australia will house a population of 35.9 million,<sup>13</sup> double its freight task from 2006 levels by 2020, tripling it by 2050.<sup>14</sup> The transport and logistics industry (worth AUD\$150 billion and 14.5 percent of national GDP) will increase the 503 billion tonne kilometres achieved in 2008 to 1,540 billion tonne kilometres in 2050.<sup>15</sup> Passenger kilometres will double 2000 levels to 675 billion per annum.<sup>16</sup> Road transport will continue to dominate even when coastal shipping and rail rises in prominence by 2020.



## fact

From 1978 to 2003, China's GDP growth per capita (purchasing power parity) multiplied by a factor of 17 from \$240 to \$4020 (USD 2003 exchange rate)

### What level of productivity do we need?

Before tackling this question, which productivity definition should be used? And how does it translate practically for the transport industry in day-to-day operation?

Multifactor productivity is the indicator used for economic growth by the US, Chinese and Australian governments. It measures changes in output per unit of combined inputs (labour, capital and intermediate outputs – such as technology and innovation).

As the transport industry is determined to raise profitability with a strong community workforce, policy measured by real (visible, bottom line) productivity returns to industry will encourage more effective investment decisions to improve the transport system and increase labour participation.

### Real transport productivity moves more people, goods and services to more places at the same time for the least additional effort

While the level of real productivity needed to nurture industry and community sustainability is difficult to calculate (economists say the data is too noisy), experienced researchers suggest we look to history for guidance and perspective.

### An historical perspective

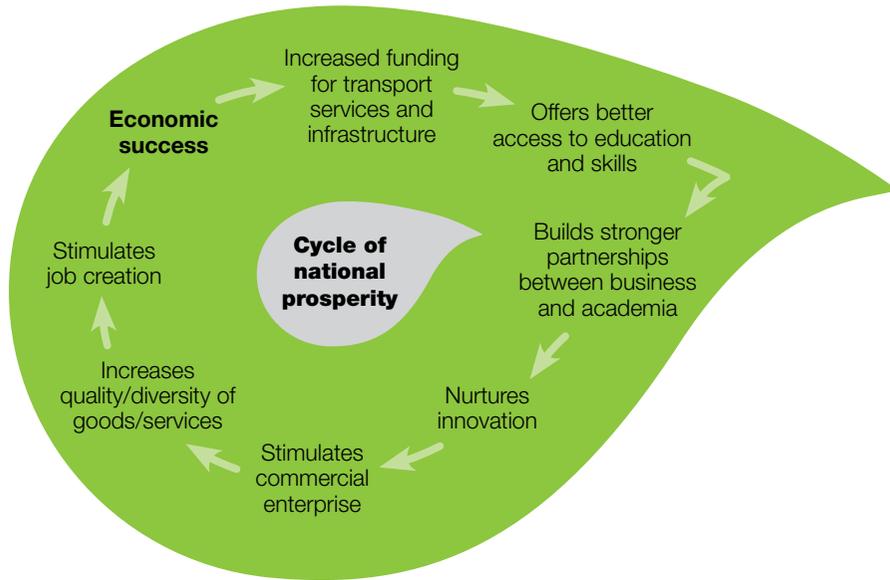
For most of the 20th century, the US was the world's productivity leader with multifactor productivity averaging two to three percent per annum before it was taken over by the Netherlands (1974), France (1982) and Norway (1991). High productivity activities with lower labour utilisation were common trends behind Europe overtaking the US.

China's accelerated catch up is easing after per annum GDP growth levels averaged 10 percent over the past decade<sup>11</sup> and now, a lower 7 percent average per annum is forecast for 2013.

Australia's most recent peak productivity period occurred between 1994 and 2003, when average GDP growth levels at 2.1 percent per annum.<sup>17</sup> Increased amounts of input and total hours worked were invested. Economists believe growth was due to a mix of information and computer technology improvements, microeconomic reform (such as deregulation) and unknown factors.

These experiences suggest GDP growth each year is necessary for a productive economy. However, modest GDP growth levels for developed countries and slightly increased growth rates for developing nations to achieve industrial levels of competitive maturity, are realistically what nations should be aiming for.

### Nations don't need big GDP growth levels to be successful



### A national vision for transport

Transport infrastructure users are willing to pay to access the ultimate mobility system, but **only** if it gives them a choice to invest in the service that offers them the most value to complete a task.<sup>18, 19, 20</sup>

Our task, as an industry, is to maximise user satisfaction, to increase output with existing transport assets, to improve both public and private profitability and to maximise long-term consumption of economically-relevant routes.

To do this, we need to create the ultimate mobility system.

We must first determine the goals for the ultimate mobility system.

What quantity of what type of output in what time period should the economy aim for? How much will consumers choose to pay for accessibility? Will price cover the marginal cost of production? What levels of dynamic efficiency can be achieved to balance short-term concerns and long-term opportunities? What level of contribution is necessary to enhance national prosperity?

### Defining the ultimate mobility system

Here's an example of how we may be able to define the ultimate mobility system.

It's a system that values and coordinates a national network of transport assets. It instinctively up-scales and downsizes asset productivity to provide a natural resilience to change.

It is agile in ways to deliver agreed service levels, despite resource demand and supply, urban development, natural hazards, economic and political cycles and climatic stimuli.

It drives efficiency for industry, affordable liveability for communities and thriving ecosystems.

To a nation, it proactively seeks real productivity gains to sharpen a nation's unique selling proposition in a globally competitive race.

*key attributes*

- National coordination
- National resilience
- Guaranteed level of service
- User experience

**User benefits**

- Equality of access
- Informed choice
- Reliable journey time
- Low fossil fuel reliance
- Enhance safety/security

**People**

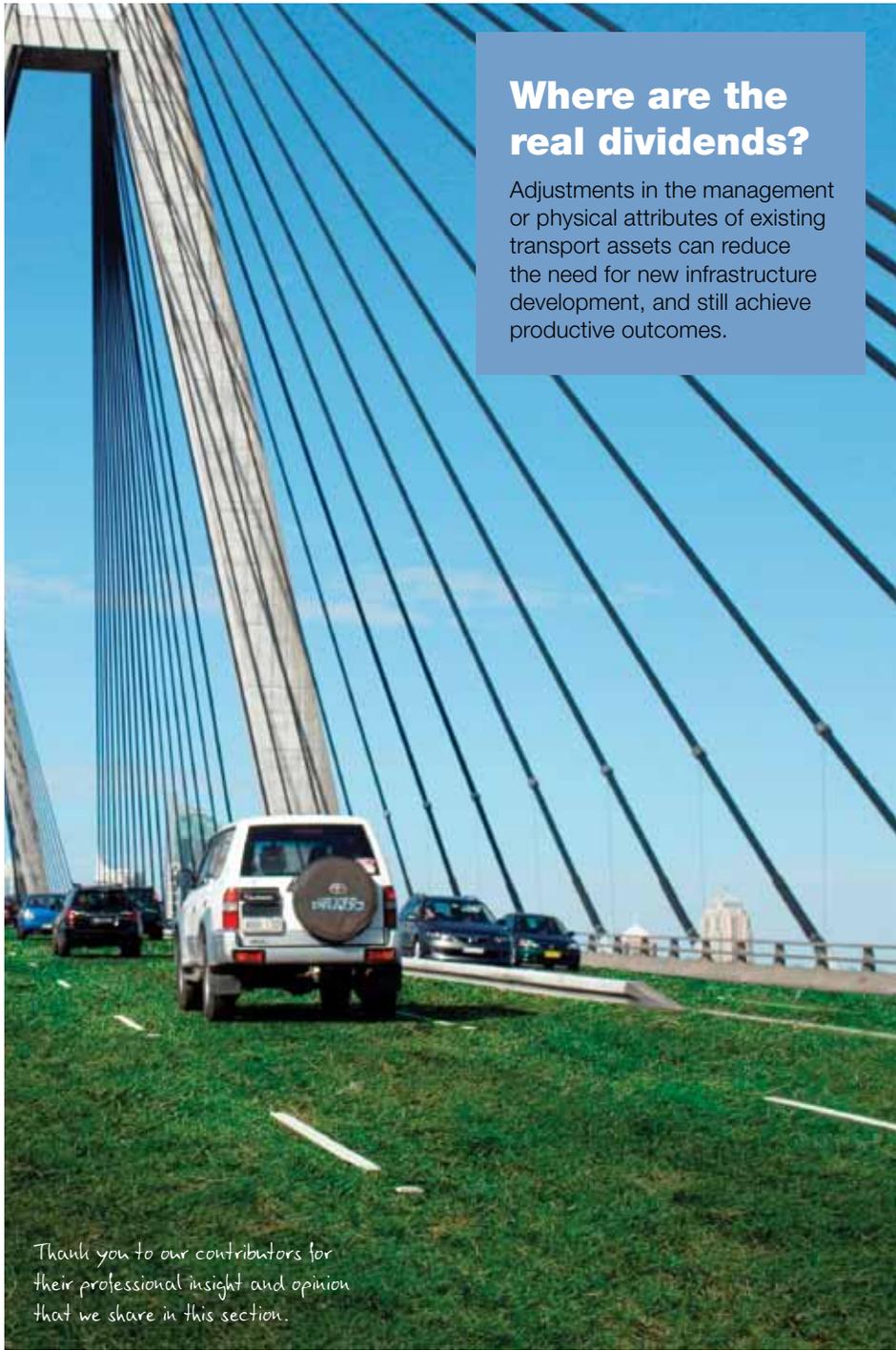
- Mass transit facilities (with peak capacity)
- Cross city-centre connections
- Active transport options
- Rapid regional transport links
- Local community activity centre connections

**Information**

- Instant freight capacity options
- Real-time travel choices
- Best route options (peak/off peak/gazetted)
- Automated administration processes
- National transparency of system capacity (multi-modal)
- Route pricing equivalent to reliable journey time
- Asset performance benchmarks
- Real-time system management/adjustments

**Freight**

- Least cost distribution input
- Profitable freight task configurations
- Short, direct-gazetted pathways
- Efficient, multi-modal interchanges
- Maximum productivity of land and transport assets
- On-demand access to mode capacity
- Competitive coastal and international gateways
- Cross-country network access



## Where are the real dividends?

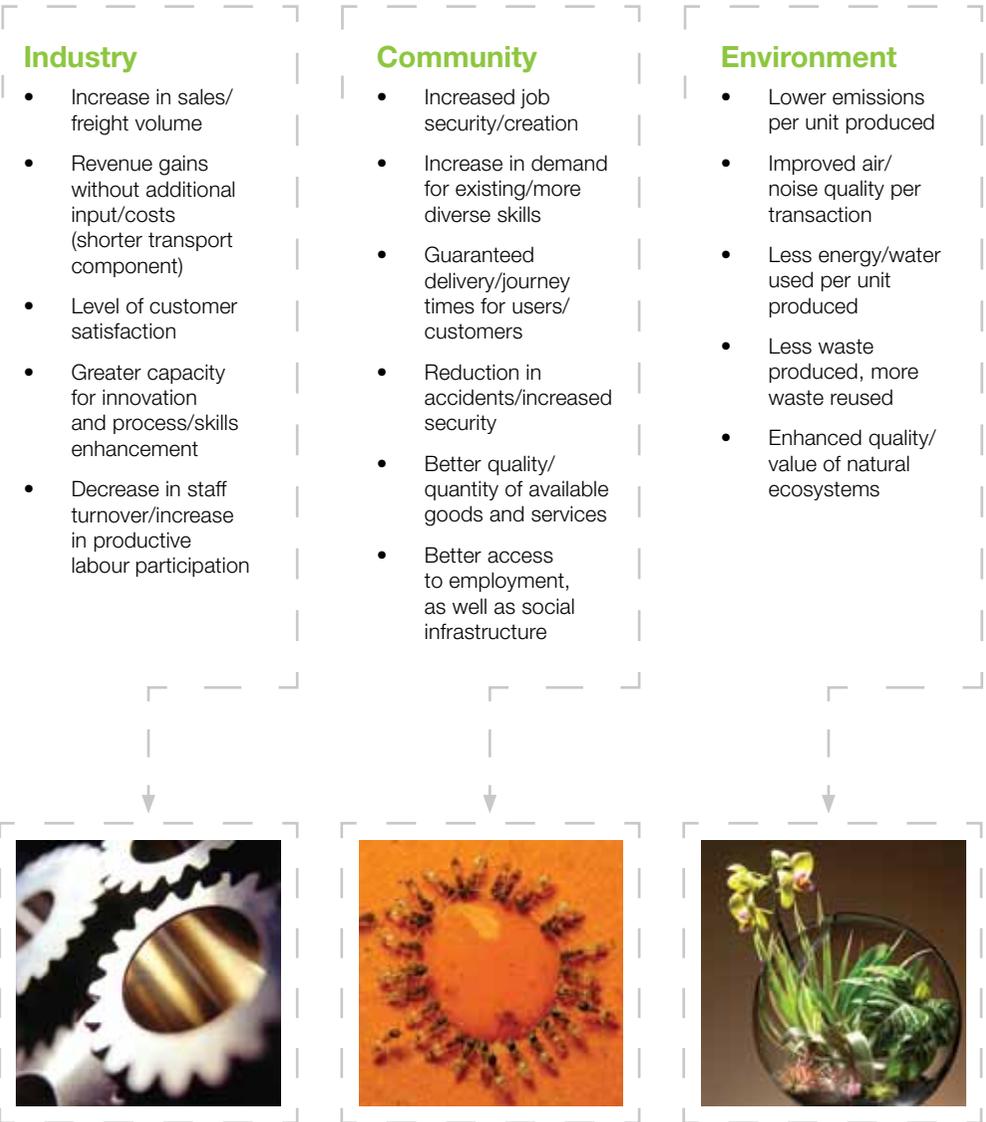
Adjustments in the management or physical attributes of existing transport assets can reduce the need for new infrastructure development, and still achieve productive outcomes.

*Thank you to our contributors for their professional insight and opinion that we share in this section.*

## What productivity measures count?

Visible bottom line productivity returns for industry, balanced with fair benefits for the community and natural environment, must be the guiding principle to drive appropriate decisions to affect productive change across a nation's transport system.

These are the attributes a nation can use to measure changes in input, to evaluate productivity returns and benefits across a wide group of stakeholders:



## Case study 01

### Ministerial Freight and Advisory Council<sup>21</sup> (formerly VFCLC) Infrastructure upgrade for Victorian freight routes

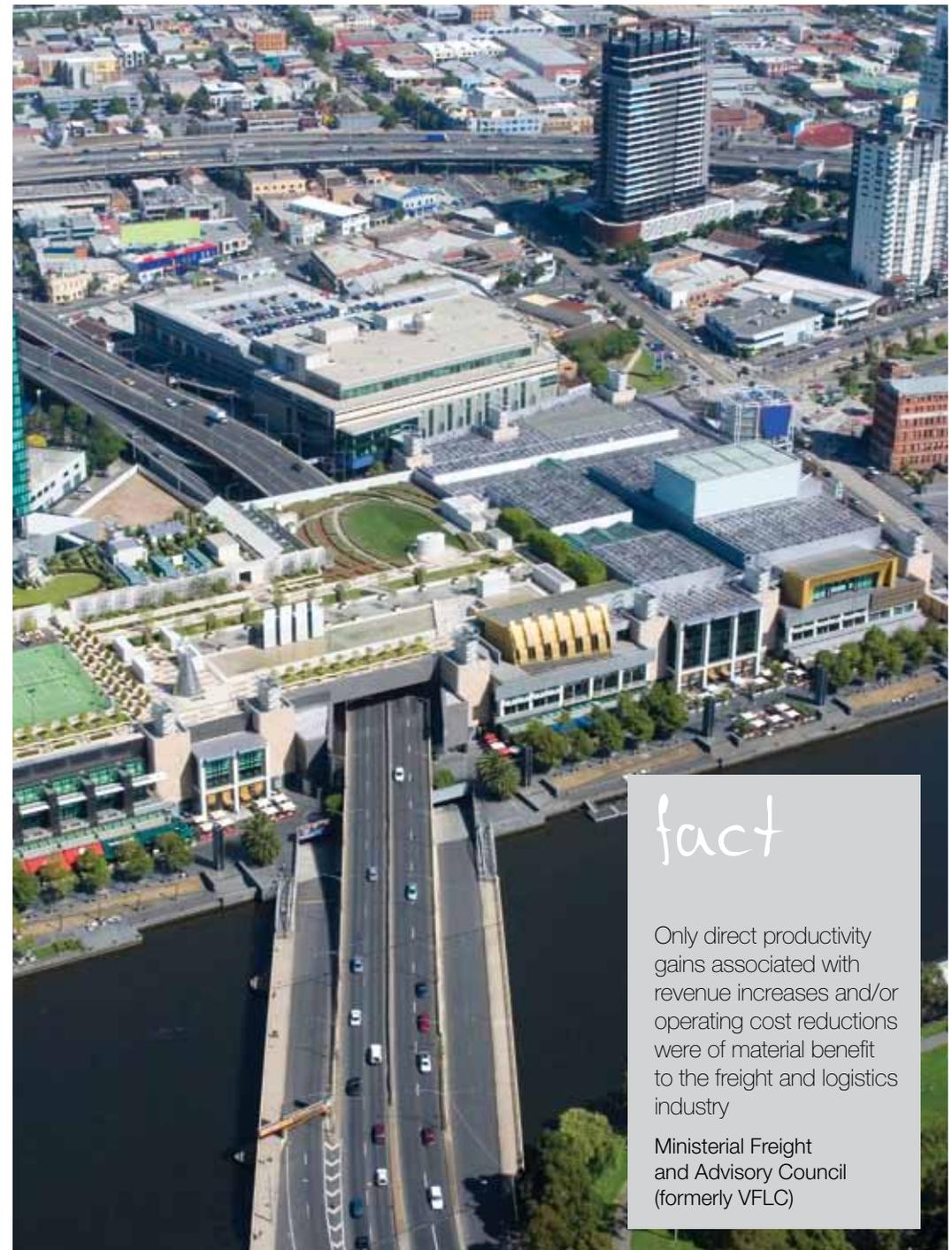
Significant work recently completed by the former Victorian Freight and Logistics Council investigated how freight supply chain productivity gains could be generated if specific infrastructure improvements were made.

Project investment viability modelling identified nine priority routes across Victoria's arterial road network. 56 individual bridge upgrade projects were proposed at an estimated upper cost of AUD213 million to improve productivity.

The proposal offered an estimated economic internal rate of return of 16 percent, at a benefit-cost ratio of 1.75.

The infrastructure improvements identified offering financial benefits to industry and broad economic benefit include:

System improvements	Financial benefit to industry	Broad economic benefit
<b>Increase in vehicle weight allowance</b>	<ul style="list-style-type: none"> <li>• Increase in revenue per freight movement</li> <li>• Savings in vehicle acquisition and replacement over 4-year periods</li> <li>• Savings in the costs of drivers and in driver training costs for new drivers</li> <li>• Savings in Intelligent Access Program (IAP) reporting and fleet management and reporting costs (vehicle will be able to move 77.5T with less operational and compliance administration)</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in escalation of freight charges</li> <li>• Reduction in overall fuel imports</li> <li>• Increased employment to rural areas</li> <li>• Increased road safety</li> <li>• Reduced urban road congestion</li> <li>• Reduced level of GHG emissions</li> <li>• Reduced noise pollution</li> </ul>
<b>More direct routes</b>	<ul style="list-style-type: none"> <li>• Decrease in fuel and driver time costs</li> </ul>	



*fact*

Only direct productivity gains associated with revenue increases and/or operating cost reductions were of material benefit to the freight and logistics industry

Ministerial Freight and Advisory Council (formerly VFCLC)

## Case study 02

### City of Bristol<sup>22</sup>

#### Freight Consolidation Centre, United Kingdom

Bristol is the UK's most congested city with more than 500,000 car movements in and out of the city centre every day. Peak travel speed reduces to 16 mph and 23 percent of travel time is spent stationary.

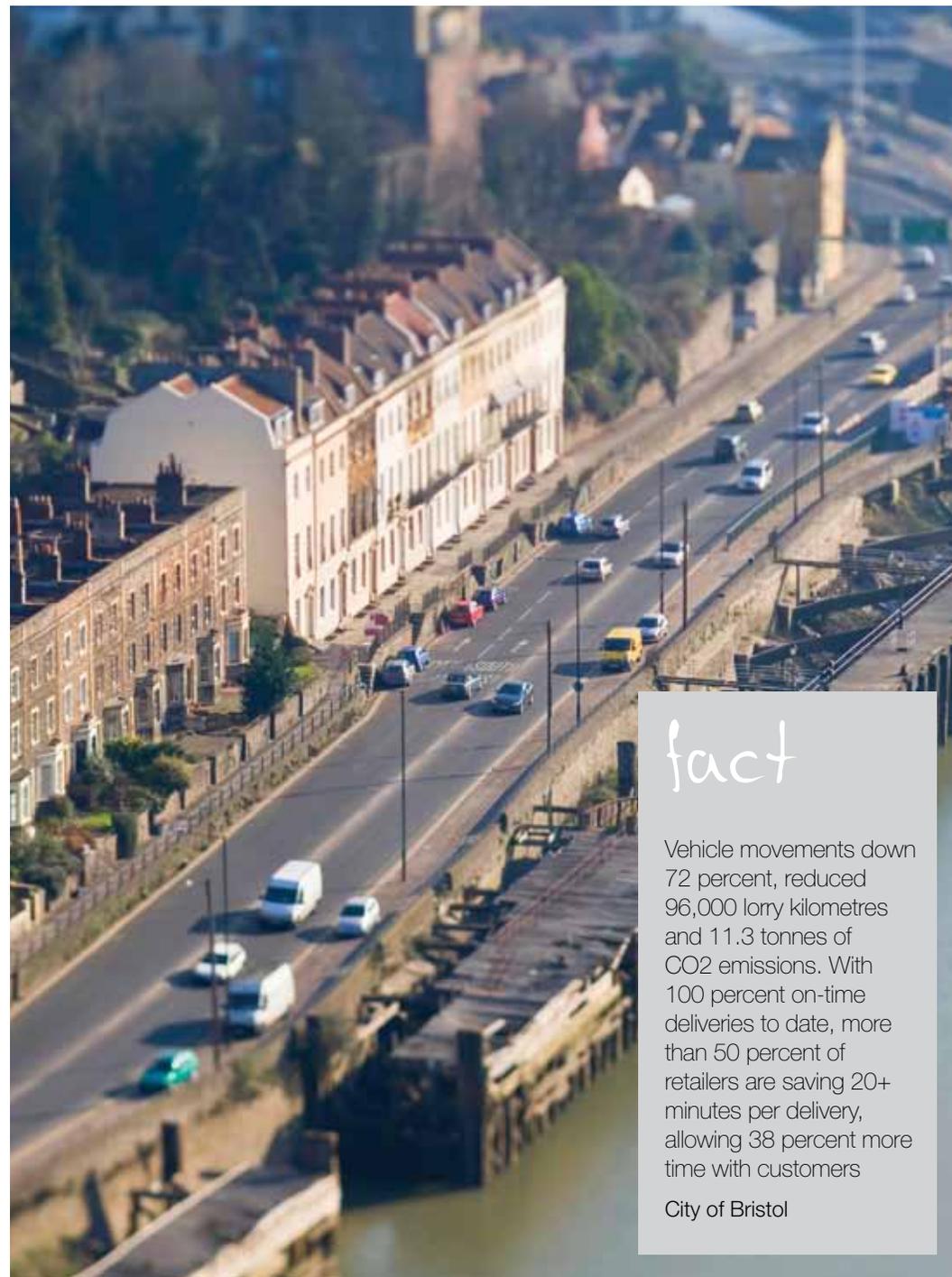
To reduce congestion and emissions, the City of Bristol undertook an extensive survey. The survey revealed freight vehicle movements were a key contributor to congestion and emissions, alongside issues relating to road maintenance and conflict with other users. Freight distribution patterns were identified and examined in detail.

To take action, the City of Bristol designed a transport policy framework to support the central management of last mile distribution into the city. The aim was to support the local economy via the effective delivery of goods.

A central delivery hub on the periphery of the city was developed to streamline deliveries and reduce the number of delivery vehicles travelling into the city centre. It provided an improved delivery service to retailers.

Known as a freight consolidation centre, the strategy reduced the number of delivery vehicles operating in the target area, contributed to improving air quality and reduced conflict between loading areas and delivery bays.

System improvements	Financial benefit to industry	Broad economic benefit
<b>Central freight delivery hub for city centre retailers</b>	<ul style="list-style-type: none"> <li>• Savings in travel time</li> <li>• Savings in costs to service deliveries (fuel/drivers/vehicles)</li> <li>• Increase in revenue due to increased capacity to deliver</li> </ul>	<ul style="list-style-type: none"> <li>• Higher productivity in same retail floor space</li> <li>• Reduced congestion in target area</li> <li>• Lower emissions, better air quality</li> </ul>
<b>Improved delivery service to retailers</b>	<ul style="list-style-type: none"> <li>• Increase in sales as more time spent with customers, reliable deliveries</li> <li>• Savings in time allocated to receiving deliveries</li> </ul>	<ul style="list-style-type: none"> <li>• Sustainability of services and facilities</li> </ul>



fact

Vehicle movements down 72 percent, reduced 96,000 lorry kilometres and 11.3 tonnes of CO2 emissions. With 100 percent on-time deliveries to date, more than 50 percent of retailers are saving 20+ minutes per delivery, allowing 38 percent more time with customers

City of Bristol

## Case study 03

**UPS<sup>23</sup>**

### Left-hand turn elimination, United States

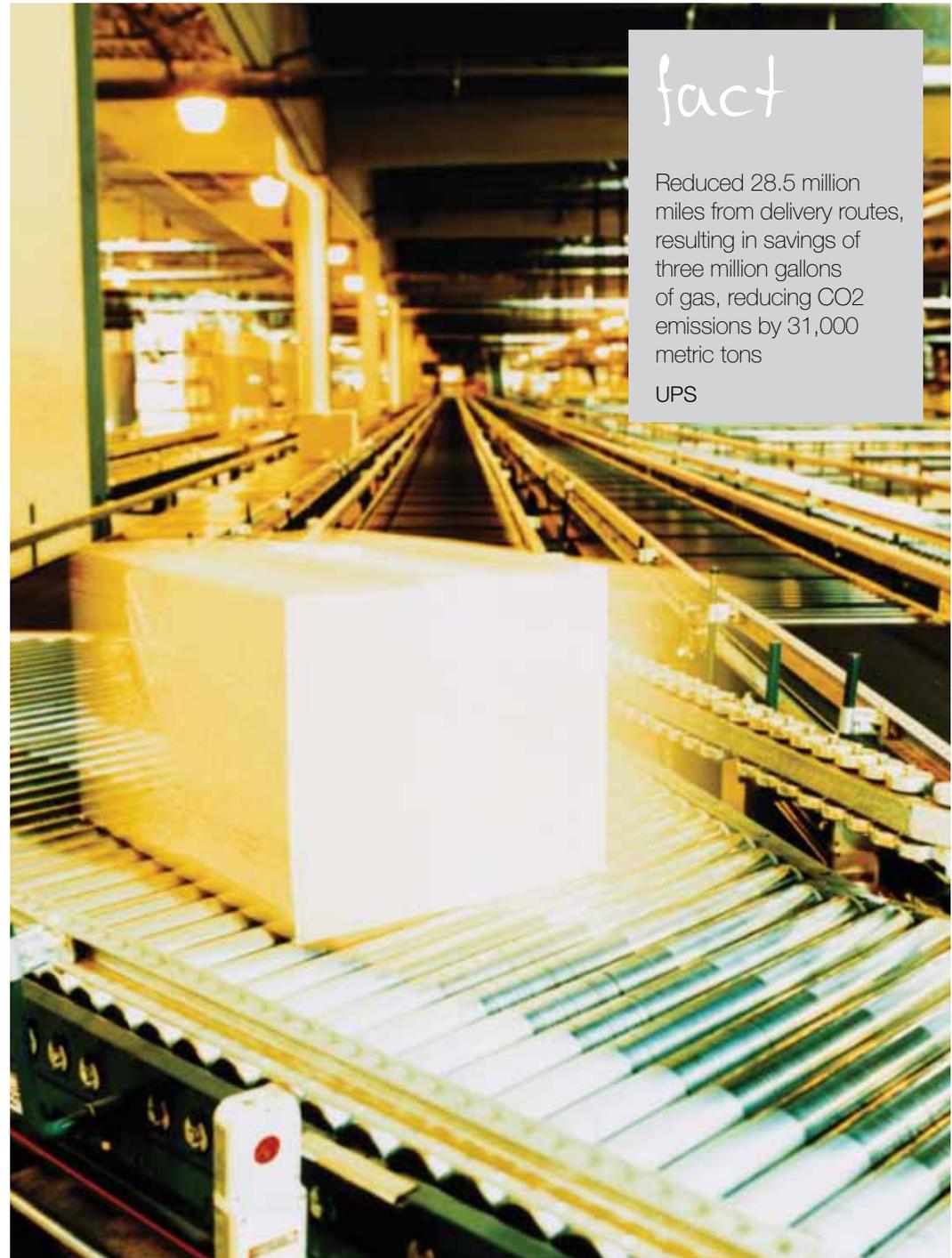
UPS send out 95,000 big brown trucks to deliver packages every day. They found that trucks sitting in left-hand lanes waiting to turn left cost not only time, but fuel and therefore money.

Using package flow software to map out driver routes with the least amount of left-hand turns, led to significant benefits for its large fleet.

System improvements	Financial benefit to industry	Broad economic benefit
Eliminated left-hand turns to reduce idling time	<ul style="list-style-type: none"> <li>• Savings in travel time</li> <li>• Savings in fuel , labour and maintenance expense</li> <li>• Increased revenue with more capacity to make more deliveries with same equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Less congestion around delivery centres</li> <li>• Better air quality, lower emissions</li> </ul>



Images courtesy of UPS



fact

Reduced 28.5 million miles from delivery routes, resulting in savings of three million gallons of gas, reducing CO2 emissions by 31,000 metric tons

UPS

## Where's our sense of urgency?

### Hot investment

A national transport system needs to focus on profitable outcomes for businesses and local communities to attract investment in upgrading infrastructure and innovating to remain competitive.

Investors will seek higher-yielding opportunities from global providers if value cannot be produced locally.

The evolution of a nation's future competitive position relies on investment in innovation to deliver efficiency. Intelligence developed elsewhere may stifle competitiveness.

### Appealing by price

A national transport system needs to offer the most efficient means of supporting the development and delivery of people, information, goods and services to offer the best value to global markets.

Successful nations invest in maximising efficiency to keep the cost of products and services to customers competitive in global markets. Information and communications technology play a key role.

### The 'sell'

A national transport system needs to drive a collective vision and connect its high value, dependable and emerging industries with global customers, engaging communities and environments as important hosts.

Nations rely heavily on strategically positioning a unique trade to attract and retain global customers and investors.

### Communities of success

A national transport system needs to give people access to services, facilities and resources and efficiently deploy labour to the most economically-relevant regions in support of job creation.

Thriving neighbourhoods support national productivity. Higher levels of available, good quality and diverse talent increases the ability to allocate skill to promote economic growth.

### The public eye

A national transport system needs to commit to a set of national priorities and ensure its productivity aims are well understood by communities and industry.

In some cases, the plans are there, but is the commitment to change?

The rate of return to society must outweigh investment spent elsewhere and the resulting benefits must offer fair and equitable value to users and beneficiaries.

Nations with a strong sense of common purpose will drive a national agenda organically.



## What tomorrow could bring

### A standard logic to identify best mode for task

A combined data set providing both industry and community a better understanding of transport efficiency across modes for a variety of freight tasks to aid operational decisions and investment direction.

### Joint industry/community-driven solutions

Transparent, real-time data accessed by transport infrastructure users and beneficiaries create innovative ideas through collaboration and ITS.

### Project viability models for real productivity

Best value project investment with visible, bottom-line returns for industry and community.

### Multi-party funding arrangements

In return for real cost savings, increased profitability and positive public endorsement, a group of users and beneficiaries offer a financial solution.

### Bi-partisan support

A change in government needn't bring about a reduction in transport system productivity.

## Leverage your appetite for change

To turn national mobility into international competitive armoury, the devil is in the detail.

Which routes in the system are most valued when considering the triple-bottom line? How much value must be derived from these routes to sustain prosperity? At what cost are users and beneficiaries willing to invest to maintain and upgrade a level of service on those routes? What vision and guiding principles for a national transport system can be shared by all?

With tight budgetary conditions, thrifty options are necessary to focus funding. New projects are necessary, but should they be a nation's last resort if real

productivity gains cannot be proven by bottom-line industry efficiency or community productivity?

The good news is that industry is providing evidence to suggest that well-derived thrifty thinking offers greater dividends to society and the economy.

The tools we need to drive productivity and elevate competitiveness are ready for action. Let's get best value by leveraging the appetite for change and putting these tools to work today.

Contact GHD to join the conversation today.

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Linking Logic invites industry, government and community collaboration to create new ideas that make a difference to the world.