

Smart tech systems cut congestion for a fraction of what new roads cost

11 November 2019, by Hussein Dia



Smart transport solutions make better use of existing infrastructure and reduce the need to build expensive new roads. Credit: [AdobeStock](#)

The [new transport projects](#) governments are constantly announcing are [expensive](#). In the recent New South Wales and Victorian elections, the returned state governments' transport infrastructure promises added up to A\$165 billion. What's mostly missing from the promised transport solutions is smart technology that provides higher benefits at a fraction of the cost—when retrofitting existing roads in particular. The benefit-to-cost ratio can be more than a dozen times greater than for a new road.

Clearly, infrastructure spending helps to drive the economy. These projects also deliver benefits to the community, including increased [road](#) safety, shorter travel times and fewer delays.

The economic merit of these projects is usually captured using a benefit-to-cost ratio (BCR). For example, the BCR of the [A\\$15.8 billion North East Link](#) road project in Melbourne is estimated to be [1.25](#) – for every A\$1 invested, A\$1.25 is returned in benefits to the economy and community. For the Melbourne Metro rail tunnel, a best-case [BCR of 3.3](#) has been reported.

But are we getting good value for money? Could cheaper alternatives deliver more benefits?

Technology offers smarter, cheaper solutions

Technology offers transport solutions that provide higher benefits at a fraction of the cost of building new infrastructure. Collectively known as [intelligent transport systems](#), these are widely recognized today as better answers for smart transport outcomes.

When [comparing](#) different "congestion-busting" options, "building more roads" provides, on average, a BCR of 3.0. This is dwarfed by the much higher BCR values of tech solutions.

[Adaptive traffic signal control](#) allows [traffic signals](#) to change based on actual traffic demand. This yields, on average, a BCR of 40.

Traffic signals along a route can be coordinated to create "[green waves](#)" for platoons of vehicles to travel without stopping. These solutions are effective for congested cities that experience rapid traffic growth and changing traffic patterns.

[Corridor management systems](#) use technology to control networks of motorways and urban roads. The average BCR is 24.

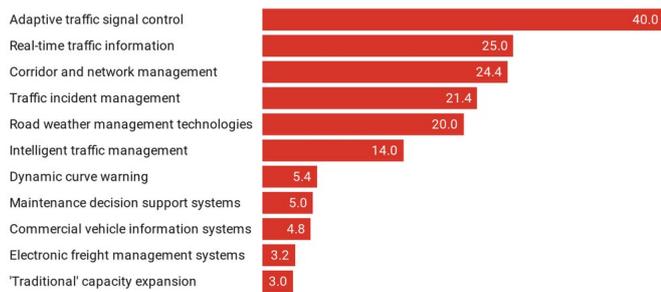
On [managed motorways](#), [ramp signals](#), [variable speed limit signs](#) and [traveler information systems](#) are [proven tools](#) to respond in real time to changing traffic conditions. In [one case](#), a managed motorway reduced travel times by 42% and accidents by 30%.

[Traffic incident management](#), which has a BCR of 21, includes technologies that aid quick detection and removal of crashes. They also detect other incidents such as broken-down vehicles or spilled loads that reduce road capacity. The systems rely on smart [software](#) that analyses sensor data in real

time.

[Benefits](#) include a 40% reduction in time to detect incidents. The technology also [reduces incident duration by 23%](#) and [road crashes by 35%](#).

Average* benefit-cost ratios of transport investments



* Values vary depending on many factors, including base conditions used for comparison

Source: Low Carbon Mobility for Future Cities: Principles and Applications (Dia, H. ed, 2017), adapted from Infrastructure Productivity: how to save \$1 trillion a year (McKinsey, 2013), Author provided

Combining tech solutions magnifies benefits

When solutions are combined, benefits are amplified. The [Florida Department of Transportation](#) implements a transport technology program on its networks. The solutions include incident management, ramp signaling, traveler information and [express lanes](#). Reduced incident duration and traffic delays are among the key benefits.

In 2018, the benefits of this program totaled almost [US\\$3.1 billion](#) (A\$4.5 billion). The costs were [US\\$70.3 million](#) (A\$102 million). That's a BCR of 43.7.

In the UK, the [cost](#) of implementing technology solutions on the [M42 motorway](#) was US\$150 million (A\$218 million) and took two years to complete. Widening the road to produce the same outcome would have taken 10 years and cost US\$800 million (A\$1.16 billion).

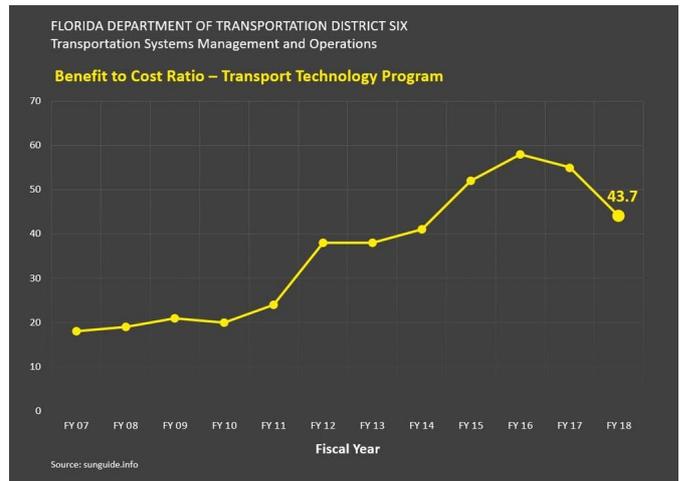
A shift in priorities is needed

Considerable investment in transport infrastructure is still required. It should be guided by strong business cases and aligned with community values and expectations.

However, technology is getting to the point where it's making a serious difference in tackling the mega challenges facing our cities. Its role must be prioritized.

The benefits are compelling. Intelligent technology systems improve the use of existing assets and increase their operational life. They enhance traveler experience and reduce reliance on building new roads. And they deliver superior value for money.

But widespread deployment of these technologies is still limited. To spur change and unlock value, we must move beyond a project-by-project approach.



Benefit-cost ratios of transport technology solutions implemented over a decade by Florida Department of Transportation. Author provided

Learn from the best

Governments can be guided by [leading nations](#) in this field such as South Korea, Japan and Singapore. Their citizens experience the benefits every day. Smart transport solutions improve their

quality of life through easier travel, less congestion and more reliable services.

The recurring policy themes in these countries include a national vision of smart infrastructure and commitment to funding. They prioritize investment in research and trials, standards development and partnerships with industry. These are key factors in the success of their tech-driven transport solutions.

These are the policies and investments Australia should prioritize. They will modernize our [transport](#) systems in innovative ways that lift our economy and living standards.

This article is republished from [The Conversation](#) under a Creative Commons license. Read the [original article](#).

Provided by Swinburne University of Technology

APA citation: Smart tech systems cut congestion for a fraction of what new roads cost (2019, November 11) retrieved 2 July 2022 from <https://techxplore.com/news/2019-11-smart-tech-congestion-fraction-roads.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.