



## **Blockchain technology**

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Part of the [Tranzinfo Hot Topics](#) series, this issue offers a selection of material on blockchain technology and its applications in the transport sector. Blockchains are decentralised, openly shared and distributed digital ledgers of cryptographically signed transactions that allow networks to operate without an intermediary. Developed originally as the accounting platform for the virtual currency Bitcoin, blockchain technology has many potential applications in transport, including increasing transparency and efficiency in supply chains; preventing cyberattacks on connected vehicles; reducing tolling costs and facilitating automated payments; improved peer-to-peer ride sharing; and improvements to the coordination of Mobility as a Service (MaaS).

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## **Overview and introduction to blockchain**

[Blockchain technology overview](#)

U.S. National Institute of Standards and Technology, draft NISTIR 8202, 2018  
This document provides a high-level technical overview of blockchain technology. It discusses its application to electronic currency in depth, but also shows its broader applications. The purpose is to help readers understand how blockchains work, so that they can be appropriately and usefully applied to technology problems. Additionally, this document explores some specific blockchain applications and some examples of when a blockchain system should be considered for use.

### [How blockchain technology could change our lives: in-depth analysis](#)

Boucher, P, European Parliamentary Research Services, 2017.

This report is aimed at providing a point of entry for those curious about blockchain technology to stimulate interest and provoke discussion about its potential impact. A general introduction is followed by a closer look at eight areas in which blockchain has been described as having a substantial potential impact. In each area, an explanation is given of how the technology could be developed, the possible impacts this development might have, and what potential policy issues are to be anticipated.

### [Blockchains: how they work and why they'll change the world](#)

Peck, ME, IEEE Spectrum, 28 Sept 2017.

Eight years after the first blockchain was built, people are trying to apply it to procedures and processes beyond Bitcoin. This article explores other uses for blockchain.

### [Distributed ledgers: scenarios for the Australian economy over the coming decades](#)

Hanson, RT, Reeson, A & Staples, M, CSIRO, Canberra, 2017

This study analyses the plausible implications of distributed ledger technology (DLT) for the Australian economy. The intended outcome is to provide advance warning of potential challenges, risks and opportunities so that leaders and innovators can make better-informed decisions.

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## **Blockchain applications in transport**

### [Blockchain disruption in transport: are you decentralised yet?](#)

Transport Systems Catapult, UK, June 2018

Blockchain could help facilitate integrated transport systems in areas like freight and logistics, autonomous vehicles and Mobility as a Service, according to a report released by the UK's Transport Systems Catapult.

### [What blockchains could mean for government and transportation operations](#)

Volpe Center, U.S. Department of Transportation, 2018

This report provides a high-level overview of blockchain concepts and how they are being used in government and transportation.

### [Blockchain and beyond: encoding 21st century transport.](#)

International Transport Forum, 2018

This report investigates the potential for digital ledger technologies (DLTs) to support broader coordination of seamless urban mobility services and the delivery of Mobility as a Service (MaaS) in urban settings.

### [Exploring blockchain: technology behind Bitcoin and implications for transforming transportation: final report](#)

Rajbhandari, R, Texas A&M Transportation Institute, 2018

Researchers envision that implementation of blockchain in transport will mostly focus on applying technology to reduce or remove third party costs (i.e., supply chain, shared mobility, tolling, asset transfer), reduce single point of failure (i.e., internet of things including connected and automated vehicles), and increase transparency (i.e., supply chain, asset transfer).

### [Open Mobility System \(OMOS\): concept paper](#)

Dietrich Sümmermann et al., MotionWerk, 2017

A concept paper for seamless Mobility as a Service (MaaS) using blockchain-based infrastructure.

### [Blockchain: the next digital frontier of freight transportation](#)

Huff, A, Commercial Carrier Journal, August 31, 2017

Blockchain has a future in freight transport, and many other industries, because it can speed up transactions, secure data transfers, and eliminate intermediaries.

### [Towards blockchain-based intelligent transportation systems](#)

Yuan, Y & Wang, F, IEEE 19th International Conference on Intelligent Transportation Systems (ITSC), 2016

Blockchain has the potential to revolutionize increasingly centralized intelligent transportation systems (ITS) applications. Blockchain can be utilized to establish a secured, trusted and decentralized autonomous ITS ecosystem, and create better usage of legacy ITS infrastructure and resources. This paper conducts a preliminary study of blockchain-based ITS.

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## **Associations**

### [Blockchain Association of Australia](#)

The objective of the Association is to enhance the blockchain ecosystem and community in Australia and to address the critical skills gap with respect to blockchain technology. The Blockchain Association of Australia aims to educate, develop and empower the blockchain community of Australia and connect with both global leaders and best practice.

### Blockchain in Transport Alliance

A forum for the development of blockchain standards and education for the freight industry. The goal of the Alliance is to bring together leading companies in the freight technology industries that have a vested interest in the development of blockchain technology.

### [MOBI: Mobility Open Blockchain Initiative](#)

MOBI is a nonprofit organization working with forward thinking companies, governments, and NGOs to make mobility services more efficient, affordable, greener, safer, and less congested by promoting standards and accelerating adoption of blockchain, distributed ledger, and related technologies.

### [Toyota Research Institute and MIT Media Lab](#)

TRI and MIT are exploring blockchain and distributed ledger technology for use in the development of a new mobility ecosystem that could accelerate development of autonomous driving technology.

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