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**The Journal of Robotics,  
Artificial Intelligence & Law**

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Editor's Note: Much Ado About AI  
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Sophie Goossens and Roch P. Glowacki

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Jennifer L. Richter and Mark Aitken

**How Smart Cities and Connected Cars May Benefit from Each Other**  
Brooke Kahn, Thomas Parisi, and Gregory Discher

Everything Is Not *Terminator*: What Does the Executive Order Calling for Artificial Intelligence Standards Mean for AI Regulation?  
John Frank Weaver

- 305 Editor’s Note: Much Ado About AI**  
Victoria Prussen Spears
- 309 AI and Text-Based Analytics in Complex Environmental Litigation:  
What Environmental Practitioners Need to Know**  
Jennifer Hammitt
- 323 FDA’s AI White Paper: To Be or Not to Be, That Is the Question**  
Nathan A. Brown, Christin Helms Carey, Howard R. Sklamberg, and  
Marlee P. Gallant
- 333 Criminal Liability and Artificial General Intelligence**  
David Atkinson
- 351 Will the EU be an Exporter of Ethical Artificial Intelligence?**  
Sophie Goossens and Roch P. Glowacki
- 357 Drones and Urban Air Mobility in the President’s Budget**  
Jennifer L. Richter and Mark Aitken
- 367 How Smart Cities and Connected Cars May Benefit from Each  
Other**  
Brooke Kahn, Thomas Parisi, and Gregory Discher
- 373 Everything Is Not *Terminator*: What Does the Executive  
Order Calling for Artificial Intelligence Standards Mean for  
AI Regulation?**  
John Frank Weaver

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# How Smart Cities and Connected Cars May Benefit from Each Other

Brooke Kahn, Thomas Parisi, and Gregory Discher\*

*This article explores how cities are already using smart transportation technologies and how connected and autonomous vehicles (“CAVs”) technologies fit into this landscape. It also addresses the legal issues and practical challenges involved in developing smart transportation systems. As CAVs and smart cities continue to develop, each technology can leverage the other’s advances and encourage the other’s deployment.*

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Innovative leaders worldwide are investing in technologies to transform their cities into smart cities—environments in which data collection and analysis is utilized to manage assets and resources efficiently. Smart city technologies can improve safety, manage traffic and transportation systems, and save energy. One important aspect of a successful smart city will be ensuring infrastructure is in place to support new technologies. Federal investment in infrastructure may accordingly benefit both smart cities and smart transportation.

Given the growing presence of connected and autonomous vehicles (“CAVs”) in the United States, and the legislative efforts surrounding them, CAVs are likely to play an important role in the future of smart cities. This article explores how cities are already using smart transportation technologies and how CAV technologies fit into this landscape. It also addresses the legal issues and practical challenges involved in developing smart transportation systems. As CAVs and smart cities continue to develop, each technology can leverage the other’s advances and encourage the other’s deployment.

## Case Study: Smart Columbus

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In 2016, Columbus, Ohio, received a grant of up to \$40 million<sup>1</sup> from the U.S. Department of Transportation (“DOT”) and up to \$10 million from Paul G. Allen’s Vulcan Inc. as part of the DOT’s Smart City Challenge. The city will use this grant toward its Smart

City initiative, “Smart Columbus,” consisting of nine projects<sup>2</sup> that “seek to demonstrate how an intelligent transportation system and equitable access to transportation can have positive impacts on every day challenges faced by cities.” The first project will be deployed starting in April 2019, with the remainder of the projects beginning in 2019 and 2020.

One of the grant-funded Smart Columbus projects is the Connected Vehicle Environment (“CVE”) project, which will incorporate smart traveler applications, automated vehicles, connected vehicles, and smart sensors into Columbus’s transportation network. The CVE project aims to enhance safety and mobility throughout Columbus’s transportation system and will focus on areas of the city with high rates of collisions. One of the project’s major components is the Columbus Traffic Signal System, a high-speed network backbone that will connect the city’s traffic signals and enable coordination throughout the system. Safety applications, including an emergency electronic brake light warning and a forward collision warning, will also be installed on transit, emergency, freight, and private vehicles.

A related project is the Connected Electric Autonomous Vehicle (“CEAV”) project, in which self-driving vehicles will be used as a transit service for residents. These CEAV vehicles are intended to communicate with CVE vehicles, initially driving along certain pre-determined routes and eventually—contingent on the project’s success—expanding to future routes in similar environments.

Like any connected system that collects and utilizes personal data from its users, Smart Columbus confronts privacy issues. Accordingly, Smart Columbus has published<sup>3</sup> a draft Data Privacy Plan that provides a framework for protecting the security of personal information that is collected and used, in line with applicable laws. Under this plan, the city is to provide prospective participants of the CVE project with a presentation addressing the privacy risks associated with their participation and then seek their informed consent.

## More Cities Implementing Smart Transportation Systems

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Several other U.S. cities are designing their own smart transportation systems, which can increase utilization of CAVs. For

example, in Pittsburgh, Pennsylvania,<sup>4</sup> 50 intersections are already equipped with smart traffic signals that use sensors to analyze traffic volume and decrease congestion; the city plans to add 150 new signals over the next two years. Similarly, Austin, Texas,<sup>5</sup> has deployed dedicated short-range communication technology at five intersections, which increases pedestrian and vehicle safety by allowing connected vehicles to communicate with the traffic signal controller. Last year, the Austin Transportation Department tested smart parking meters<sup>6</sup> and gathered data about parking turnover rates and revenue as part of its Smart Mobility Program.

Cities are also considering the use of CAVs to provide public transportation and ride-sharing services as part of their smart city initiatives. Denver, Colorado,<sup>7</sup> for example, has launched a pilot electronic autonomous shuttle service, which currently travels along a one-mile route and connects to a smart-city community in Denver. Cincinnati, Ohio,<sup>8</sup> entered into a partnership with a ride-sharing company last year to identify potential improvements to shared mobility services and to public transportation. Combining data such as drop-off and pick-up activity with insights derived from local transit agencies, the Cincinnati Mobility Lab<sup>9</sup> aims to equip transit agencies with the best information on how they can plan for their future.

## Proposed Legislation and Government Action

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Lawmakers are increasingly recognizing the benefits to cities and states from smart transportation systems and their ability to interact with CAVs, with measures including:

- The Innovative Materials for America's Growth and Infrastructure Newly Expanded (IMAGINE) Act (R. 1159),<sup>10</sup> introduced in the House on February 13, 2019. The bill's purpose is to "encourage the research and use of innovative materials and associated techniques in the construction and preservation of the domestic transportation and water infrastructure system." As discussed above, infrastructure is an important aspect of a smart transportation system.
- B. 659,<sup>11</sup> a California bill introduced on February 15, 2019, to establish the California Smart City Challenge Grant Program to allow municipalities to compete for grants to use



toward emerging transportation technologies. According to the bill, this program would encourage municipalities to “incorporate advanced data and intelligent transportation system technologies and applications into their transportation planning efforts.”

## Takeaways

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Smart transportation will be an important aspect to any smart city program. Public and private stakeholders would be well served to consider integrating transportation and CAVs as they design and implement smart cities efforts.

## Notes

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