

Impacts of Autonomous Vehicles on Public Health

Transportation point of impact	Impact	Uncertainty	Transportation-related health risk factors	Major health issues	Manner of impacts	Pathway number	
Transportation job	Transportation-related job loss		Social exclusion	Mental health, health care access, obesity	Adverse	1	
Transportation equity	Providing access to social, academic, health, and jobs for elderly, non-licensed, and individuals with mental, physical and visual disabilities		Access	Health care accessibility	Positive	2	
			Mobility independence	Mental health, health care access, obesity	Positive	3	
			Social inclusion	Mental health	positive	4	
Land use and built environment	Urban sprawl and longer distance between origin and destinations		Social exclusion	Mental health, health care access, obesity	Adverse	5	
			Community severance	Mental health, health care accessibility, obesity	Adverse	6	
			Access	Health care accessibility	Adverse	7	
	Increases in the Vehicle Miles Traveled (VMT)			Noise	Cardiovascular diseases, birth defects, type-2 diabetes, cognitive impairment, mental health, hearing issues	Adverse	8
				Heat	Cardiorespiratory diseases, children respiratory diseases, diabetes	Adverse	9
				Air pollution	Cardiovascular diseases, respiratory diseases, lung cancer, skin cancer, asthma	Adverse	10
				Greenhouse gases	Cardiovascular diseases, lung cancer, asthma	Adverse	11
				Contamination	Cardiovascular diseases, cognitive impairment, mental health, kidney failure, birth defects	Adverse	12
				Green spaces	Cardiovascular disease, mental health, and birth defects	Uncertainty	13
				Physical inactivity	Cardiovascular diseases, mental health, breast cancer, colon cancer, obesity	Uncertainty	14
Traffic flow	Smoother and efficient driving with the aim of connected infrastructure which enables traffic platooning. This will consequently increase traffic flow and speed, and reduce traffic congestion and delay.	Increase in speed is associated with more noise emission; however, the electric vehicles can mitigate the noise exposure depending	Contamination	Cardiovascular diseases, cognitive impairment, mental health, kidney failure, birth defects	Positive	15	
			Greenhouse gases	Cardiovascular diseases, lung cancer, asthma	Positive	16	
			Heat	Cardiorespiratory diseases, children respiratory diseases, diabetes	Positive	17	
			Noise	Cardiovascular diseases, birth defects, type-2 diabetes, cognitive impairment, mental health, hearing issues	Uncertainty	18	
			Air pollution	Cardiovascular diseases, respiratory diseases, lung cancer, skin cancer, asthma	Positive	19	
			Stress	Mental health, type-2 diabetes, cardiovascular diseases	Positive	20	
Trip, mode and route choice	Encouraging a shift from public transit and active transportation to private cars which can increase the total VMT in the system		Contamination	Cardiovascular diseases, cognitive impairment, mental health, kidney failure, birth defects	Adverse	21	
			Greenhouse gases	Cardiovascular diseases, lung cancer, asthma	Adverse	22	
			Heat	Cardiorespiratory diseases, children respiratory diseases, diabetes	Adverse	23	
			Noise	Cardiovascular diseases, birth defects, type-2 diabetes, cognitive impairment, mental health, hearing issues	Adverse	24	
			Air pollution	Cardiovascular diseases, respiratory diseases, lung cancer, skin cancer, asthma	Adverse	25	
			Community severance	Mental health, health care accessibility, obesity	Adverse	26	
			Physical inactivity	Cardiovascular diseases, mental health, breast cancer, colon cancer, obesity	Adverse	27	
Transportation infrastructure	AVs infrastructure and equipment	Besides the increase in roadway capacity from platooning and shifting to shared AVs can reduce the need for transportation infrastructure.	Electromagnetic field	Cognitive impairment, birth defects, leukemia	Adverse	28	
	Changes in transportation demand and modal shift after AVs implementation may increase parking and roadway needs.		Community severance	Mental health, health care accessibility, obesity	Uncertainty	29	
			Heat	Cardiorespiratory diseases, children respiratory diseases, diabetes	Uncertainty	30	
			Green spaces	Cardiovascular disease, mental health, and birth defects	Uncertainty	31	
Traffic safety	Promoting traffic safety by eliminating drivers' error	System operation failure, malfunctioning error, cybersecurity, and safety over-feeling of passengers and vehicle performance during unavoidable crashes	Motor vehicle crashes	Disability	Uncertainty	32	