

Decarbonizing Health Care:

Low-Carbon Transportation Policies
Can Reduce Health Care Emissions
and Benefit Local Communities



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About This Report

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Cover images: (Left) Ambulances outside a hospital in New York. Credit: Wikimedia Commons. (Right) A healthcare worker rides a bicycle from a bike share in a designated lane. Credit: Better Bike Share.

Low-Carbon Transportation Policies Can Reduce Health Care Emissions and Benefit Local Communities

Executive Summary

As Health Care Delivery Organizations (HDOs)¹ strive to reduce their greenhouse gas emissions, they inevitably grapple with the carbon pollution generated as their patients and employees travel to and from the facility, and as vital supplies and materials are shipped and delivered. Transportation -- particularly diesel trucks and other heavy vehicles -- also contributes to harmful air pollution that affects human health in the communities around each facility, often in ways that perpetuate historic and ongoing inequities. Our analysis suggests that the policies and programs available to healthcare delivery organizations have the potential to significantly reduce their contributions to climate-warming pollution while simultaneously improving health and addressing health- and climate-equity in the communities they serve. As in our previous paper on energy policies, we outline steps that HDOs can take to reduce their direct contributions to climate change and air pollution, as well as areas where HDOs' leadership can help accelerate positive change nationally and in the states and municipalities where they operate.

This paper also highlights the critical role that transportation plays in connecting HDO's to their local communities. In particular, efforts to reduce emissions from transportation present an important opportunity to center environmental justice and equitable distribution of benefits in HDO decarbonization efforts. Health care providers and hospitals often play a critical role in underserved communities and may serve as "anchor institutions²" that can have a positive economic and social influence beyond providing health care service. Transportation emissions from HDOs also may be a source of local air pollution that contribute to health impacts in their

¹ This paper focuses on health care delivery organizations, which are defined as hospitals, clinics, and other institutions that provide health care services to patients. In some cases, the paper addresses hospitals specifically, which contribute a significant portion of the emissions from health care delivery organizations. In other places, the paper refers to the entire health care sector, particularly where the available data does not break out health care delivery organizations specifically. Note that the economy-wide policies for transportation discussed in the paper would address the entire sector, not just health care delivery.

² Anchor institutions are "nonprofit or public institutions firmly rooted in place, given their mission, invested capital, or customer relationships." See [Health Care Without Harm, Anchored by Health Care: Strategies for Health Systems](#), May 2023.

surrounding communities.³ This creates an added obligation to provide leadership on policies and practices to promote clean transportation.

Given the significant impact of greenhouse gas (GHG) emissions from transportation on health care sector direct and indirect emissions, it will be difficult for HDOs to reach ambitious targets such as those in the HHS Health Sector Climate Pledge⁴ without broad economy-wide initiatives to decarbonize the transportation sector. Therefore, it is critical for HDOs, particularly those that have made ambitious GHG reduction pledges, to provide leadership on the development of these broader transportation policies while simultaneously taking robust actions to reduce their onsite emissions and emissions in their surrounding communities.

Finally, HDOs have an unprecedented opportunity to work with community leaders to ensure that environmental health and access to health care are considered in state and local transportation planning decisions. This is an especially critical moment to do so because incentives and investments from the Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA, also known as the Bipartisan Infrastructure Law or BIL) have the potential to reshape transportation systems in many communities.

Roadmap

This Executive Summary summarizes the paper's recommendations for HDOs and government agencies. Section I provides background information on the linkages between health care organizations, equity, and low-emission transportation options. Section II explores policies and programs that facilitate decarbonization of HDO fleets, including cars, shuttles, and ambulances. Section III addresses policies and programs to reduce emissions from freight, including from the delivery of a myriad of medical and non-medical supplies and products to hospitals and other health care facilities. Section IV examines policies and programs to improve access to and reduce emissions from employee and patient transportation, including telehealth programs and equitable approaches to low-carbon transportation that can benefit local communities. Section V addresses provisions in new infrastructure and clean energy laws that provide multiple benefits to underserved communities including cleaner, safer, and more accessible transportation options. Section VI provides conclusions.

³ Underserved communities may be exposed to higher levels of fine particles, ground-level ozone, and other conventional pollution – including the pollution generated by HDOs – which can cause increased incidence of childhood asthma, premature mortality, and other health impacts.

⁴ U.S. Department of Health and Human Services, [HHS Shares Health Sector Emissions Reduction and Climate Resilience Announcements at COP27](#), November 10, 2022.

Summary of Policy Recommendations

A previous GCC paper in this series examined energy policies and incentives that could reduce emissions from energy use at HDOs.⁵ In that paper, we recommended that HDOs focus on policies that reduce emissions at their own facilities and while simultaneously leading the way on broader national and subnational policies to accelerate the process of decarbonizing electricity and energy systems. A similar recommendation is appropriate for transportation emissions. We find that HDOs can take a two-tiered approach to shrinking their carbon footprint and other environmental impacts from transportation; first by adopting policies and programs to reduce their own emissions and those of their employees, patients, and suppliers, and second by engaging with broader state and local policy solutions that will complement their internal efforts at decarbonization.

More specifically, we find the following policies and incentives would have the largest potential impact on the healthcare sector's transportation emissions and the greatest benefits for local communities.

HDOs can reduce their own fleet emissions by leveraging new incentives.

New provisions of the IRA could have a significant impact on direct emissions from hospital fleets, but only if HDOs take advantage of the opportunities. New and expanded incentive programs for electric vehicles (EVs) and charging infrastructure will make it easier for rural hospitals and hospitals in low-income communities to reduce their direct on-site emissions from fleets while lowering overall fuel costs.⁶ Hospital fleets vary and may include a variety of vehicles, including ambulances, courier cars and vans, supply trucks, home health care vehicles, and shuttle buses.⁷ The IRA has an “elective payment” provision that will allow not-for-profit hospitals to benefit from clean energy tax incentives for commercial fleets, an option not previously accessible to organizations exempt from federal tax liabilities.⁸ In addition, by taking advantage of federal, state, and local fleet electrification and charging incentives, HDOs can reduce their own emissions and reduce the impact of HDO vehicles on air quality in the surrounding community.

⁵ Georgetown Climate Center (GCC), [Decarbonizing Health Care: Clean Energy Policy Options](#), April 2023.

⁶ IRA EV-charging infrastructure incentives are targeted at rural and low-income communities. However, as discussed later in the paper, the IIJA provides broader incentives and funding for EV charging infrastructure.

⁷ Practice Greenhealth, [Fleet Vehicles](#).

⁸ Note that this provision was previously called “direct payment” in the text of the IRA, but the Internal Revenue Service (IRS) now uses the term “elective payment.” See Internal Revenue Service (IRS), [Elective pay and transferability](#), update December 28, 2023. For a full list of elective pay provisions in the IRA, see IRS, [Clean Energy Tax Incentives: Elective Pay Eligible Tax Credits](#), Publication 5817-G (6-2023).

HDOs can provide leadership on broader freight-sector vehicle decarbonization.

Policies and programs that address emissions from the transport of freight are particularly important as trucks are one of the top sources of health care GHG emissions (see Figure 2 on page 18), contributing an estimated 4.8% of overall health care sector emissions.⁹ These indirect “Scope 3” emissions are subject to broader emissions regulations and transportation planning policies that impact how people and goods move. (See text box on pages 5-6 for an explanation of emissions scopes under the GHG Protocol.) In addition, diesel-powered trucks that ship goods to hospitals are a source of fine particle (PM2.5 or soot) emissions. Efforts to decarbonize trucks can also reduce this type of hazardous pollution, which can cause or exacerbate a variety of health impacts, including asthma and other cardiovascular diseases, for the communities surrounding medical facilities.

HDOs can choose to participate in EPA’s SmartWays Program and partner with suppliers whose fleets meet voluntary standards and practices for emissions reduction. Additionally, while the comment period has closed on the EPA’s most recent rulemaking addressing emissions from trucks (Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles - Phase 3), HDOs can join other health organizations in offering written comments and testifying at hearings to ensure that environmental impacts on human health and the health care sector are accounted for in future GHG and air quality regulations that affect trucks that transport freight.

HDOs can encourage low-emission commuting and expand opportunities for patient care through telehealth.

HDOs can adopt internal programs and policies to encourage employees and patients to use low-carbon modes of transportation. The lowest carbon trips are the ones that don’t have to be taken at all, so telemedicine is an increasingly important part of the low-carbon healthcare equation.

- Coordinating with local and state governments and electric utilities to install on-site EV charging infrastructure (including any necessary upgrades to hospital electrical systems) to increase accessibility for patients and employees;
- Expanding telehealth options for patients;
- Incentivizing and enabling employees to take public transit; and
- Incentivizing or enabling employees or patients to use active transportation including cycling and walking.

⁹ Eckelman, Matthew J., et al., [Health Care Pollution and Public Health Damage in the United States: An Update](#), *Health Affairs* 39, no. 12 (Dec. 2020): 2071–79.

Although the development and implementation of some of these policies are the responsibility of federal, state, and local authorities, the transportation planning process¹⁰ would benefit from the engagement and leadership of health care delivery organizations and other actors in the health care sector.

HDOs can help local communities access resources to reduce pollution and provide cleaner and safer transportation options.

Several provisions of the IRA and IIJA are geared toward assisting underserved communities with cleaner and safer transportation options. These provisions have the potential to reduce pollution in communities while increasing access to health care in a sustainable way. Implementation and prioritization of these provisions by state and local governments will be critical, and HDOs should consider lending their expertise and input into planning and implementation decision-making by their state and local officials. In addition, through participation in new provisions to encourage community-based air quality monitoring, HDOs can highlight the health impacts of high-emissions transportation and work with communities to monitor progress in making local air quality healthier.

Emissions Inventories and Emissions Policies

Two types of emissions inventories are relevant to addressing health care emissions; we refer to both throughout this paper. Many companies and large organizations, including those in the health care sector, use the emissions accounting and reporting methodologies from the GHG Protocol, which captures both direct and indirect emissions that are attributable to an organization. The GHG Protocol, developed by the World Resources Institute and the World Council for Sustainable Development with the input of hundreds of stakeholders, classifies GHG emissions into three “scopes.” Scope 1 includes direct emissions from sources owned or controlled by an organization. Scope 2 covers indirect emissions from the generation of purchased electricity and steam. Scope 3 encompasses all indirect emissions (not included in Scope 2) that occur in the value chain of the reporting organization or company, including both upstream and downstream emissions. Figure 1, developed by the United Kingdom’s National Health Service, depicts how the three scopes apply to health care organizations.

A second type of emissions inventory includes data on the original sources of emissions and is used by federal and state policymakers. This type of inventory accounts for emissions at the broad sectoral level (e.g., transportation, electricity, buildings, industrial, agriculture,

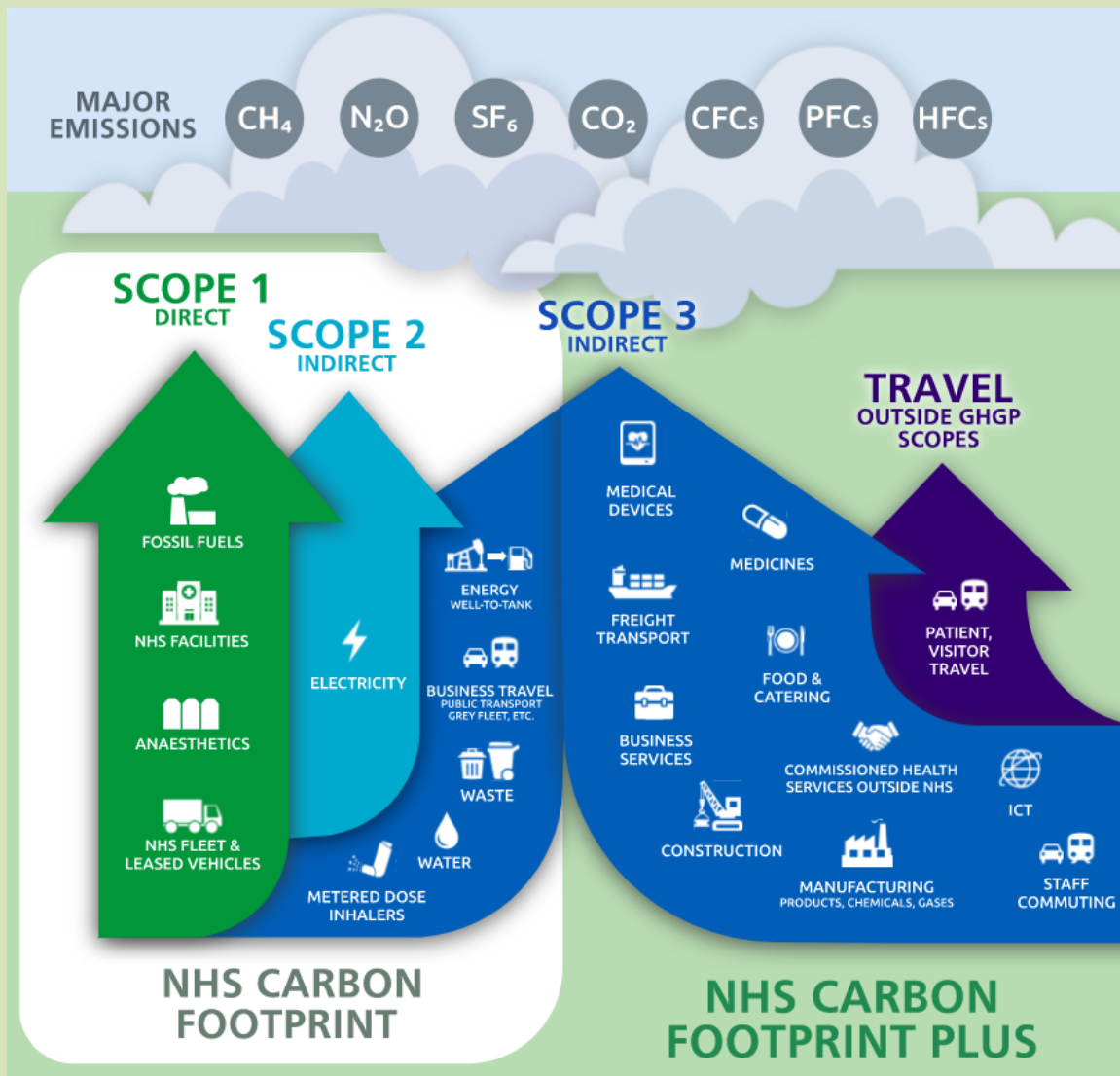
¹⁰ For more detail on the transportation planning process, see Levandowski, R., [BLOG: A growing number of states are taking steps to align transportation planning decisions with climate targets](#), Georgetown Climate Center, January 10, 2024.

etc.) and informs policies that focus on emissions sources within these sectors. Policymakers use these sectoral inventories because a) governmental entities typically have regulatory authority only over direct sources of emissions within their geographic boundaries, and b) they make emission reduction commitments based on these direct sources of emissions. For example, the U.S. commitments under the United Nations Framework Convention on Climate Change are based on methodologies that quantify direct emissions, rather than the indirect embedded emissions in products consumed. Similarly, state government GHG commitments are based on direct emissions within their jurisdictions, and more than 30 states have greenhouse gas goals or statutory targets based on emission reductions within their geographic boundaries.¹¹

In this paper, we include a focus on federal, state, and local low-carbon transportation policies that address emissions at their sources and can contribute to reductions in emissions from more than one of the scopes covered by the GHG Protocol. In addition to contributing to emissions reductions in Scope 1 through cleaner new cars and trucks in vehicle fleets, policies that decarbonize the transportation sector have an impact on several sources of Scope 3 emissions, including employee commuting, patient travel and transport of freight by trucks and other means. In other words, federal and state policies can reduce the carbon footprints of tens of millions of vehicles, including cars and buses used for employee and patient transportation and trucks that deliver thousands of types of supplies and products to hospitals and other health care facilities.

¹¹ Center for Climate and Energy Solutions. [U.S. State Climate Action Plans - Center for Climate and Energy Solutions](#), December 21, 2022.

Figure 1: UK National Health Service Depiction of Healthcare Organization Emissions by Scope¹²



¹² National Health Service, [Delivering a 'Net Zero' National Health Service](#) (NHS, Oct. 2020).

I. Background: Communities, Health Care, and Equitable Low-Emission Transportation

This section provides background and context on the linkages between HDOs, equitable low-emission transportation, and communities. Addressing these links is important because policies and programs to reduce HDOs carbon footprint can also provide multiple benefits to communities surrounding health care facilities. This applies to virtually every policy and approach addressed in subsequent sections of the paper. For example, policies to decarbonize HDO vehicle fleets and freight delivery also reduce local air pollution (Sections II & III); programs and incentives to reduce emissions from employee and patient transportation also provide safer and healthier travel options for workers and patients who live in nearby communities (Section IV); and equitable transportation and environmental justice initiatives in the IRA and IIJA allow HDOs to partner with community members on initiatives to monitor and reduce emissions and provide better access to safer and healthier low-carbon transportation options (Section V).

Health Care Sector's Role on Equitable, Low-Emission Transportation

The health care sector is responsible for 8.5% of overall U.S. greenhouse gas emissions, including direct emissions, electricity and steam used at health care facilities, and indirect emissions from the sector's supply chain of goods and services.¹³ Hospital care accounts for an estimated 35% of the health care sector's emissions and is the largest component of the sector's carbon footprint.¹⁴

Many leaders within the health care field believe the sector bears a responsibility to lead on reducing greenhouse gas emissions because the impacts of climate change affect public health in many ways.¹⁵ Recognizing their own contributions to climate change and the connections between activities that greenhouse gas emissions and other types of harmful air pollution, health care delivery organizations (HDOs) are increasingly working to reduce their GHG emissions

¹³ Eckelman, Matthew J., et al., [Health Care Pollution and Public Health Damage in the United States: An Update](#), *Health Affairs* 39, no. 12 (Dec. 2020): 2071–79.

¹⁴ Sampath, B., et al., [Reducing Healthcare Carbon Emissions: A Primer on Measures and Actions for Healthcare Organizations to Mitigate Climate Change](#). (Prepared by Institute for Healthcare Improvement under Contract No. 75Q80122P00007.) AHRQ Publication No. 22-M011. Rockville, MD: Agency for Healthcare Research and Quality; September 2022.

¹⁵ See, for example, Singh, H., [How Clinicians Can Lead Climate Action to Protect Patients and the Planet](#), Commonwealth Fund Blog, December 1, 2023.

through internal commitments, and through a variety of broader initiatives, including the National Academy of Medicine (NAM) Action Collaborative on Decarbonizing the U.S. Health Sector¹⁶, the White House-Department of Health and Human Services (HHS) Health Sector Climate Pledge¹⁷, and the HHS-sponsored Catalytic Program on Utilizing the IRA.¹⁸

The health care sector's role in reducing greenhouse gas emissions carries particular weight because climate change itself has profound negative impacts on physical and mental health,¹⁹ especially for underserved and vulnerable communities.²⁰ Climate change also puts HDOs themselves at risk. Extreme weather events that cause billions or even hundreds of billions of dollars in damage are on the rise,²¹ and the health care sector is not exempt from their impacts. Such disasters disrupt patient care, increase costs, and reduce revenue.²² They can lead to suspension, closure, and evacuation of hospitals, disrupt supply chains, require infrastructure repairs and cleanup, disrupt important research, cause patients to delay or cancel care, and make it more difficult to retain staff, among other issues.²³ Almost 75% of hospital evacuations between 2000 and 2017 were due to climate-sensitive events,²⁴ and a case study of ten climate-sensitive events in 2012 estimated the resulting health-related costs were \$10 billion.²⁵

¹⁶ National Academy of Medicine, [Action Collaborative on Decarbonizing the U.S. Health Sector](#), accessed February 22, 2023.

¹⁷ U.S. Department of Health and Human Services, [HHS Shares Health Sector Emissions Reduction and Climate Resilience Announcements at COP27](#), November 10, 2022.

¹⁸ U.S. Department of Health and Human Services, Office of Climate Change and Health Equity, [Catalytic Program on Utilizing the IRS](#).

¹⁹ Intergovernmental Planet on Climate Change (IPCC), [Summary for Policymakers](#) in [Climate Change 2022: Impacts, Adaptation and Vulnerability](#), 2022.

²⁰ Deivanayagam, T. A. et al., [Envisioning Environmental Equity: Climate Change, Health, and Racial Justice](#), Health Policy Volume 402, Issue 10395, P64-78, The Lancet, May 29, 2023.

²¹ National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI), [U.S. Billion-dollar Weather and Climate Disasters, 1980-Present](#), July 30, 2023.

²² Healthcare without Harm, [Safe Haven in the Storm](#), January 2018.

²³ Ibid.

²⁴ Salas, R. N. et al., [Adding a Climate Lens to Health Policy in the United States](#), Health Affairs Volume 39, Number 12, December 2020; citing to Mace, S. E. and Sharma, A., [Hospital Evacuations Due to Disasters in the United States in the Twenty-First Century](#), American Journal of Disaster Medicine Publication No. 15(1):7-22, December 1, 2020.

²⁵ Salas, R. N. et al., [Adding a Climate Lens to Health Policy in the United States](#), Health Affairs Volume 39, Number 12, December 2020; citing to Limaye, V. S. et al., [Estimating the Health-Related Costs of 10 Climate-Sensitive U.S. Events During 2012](#), GeoHealth Volume 3, Issue 9, p. 245-265, American Geophysical Union, September 17, 2019.

The impacts of the climate crisis will worsen existing inequities in health care, particularly for low-income people and for people of color.²⁶ Access to care is already a challenge; in 2022, 38% of Americans reported delaying medical treatment due to cost,²⁷ and from 1999 to 2017 a higher percentage of Black and Hispanic Americans delayed care compared to White Americans.²⁸ As of 2021, Black, Hispanic, and Native Americans had higher uninsured rates than non-Hispanic White Americans.²⁹ Yet lower-income people and people of color are particularly in need of health services, especially during climate emergencies.

Additionally, climate change will disproportionately impact already overburdened communities. Because of structural and historic racism in housing and urban planning policy, Black Americans are more likely to live in neighborhoods with high levels of fine particles and other types of air pollution, leading to higher risk of respiratory and cardiovascular disease, depression, and poor birth outcomes. Air pollution and climate impacts can exacerbate these conditions.³⁰ People of color and low-income families are also more vulnerable to adverse health impacts from wildfires, flooding, and extreme heat due to disparities in housing quality and working conditions.³¹

Neglected public infrastructure can become unsafe during extreme weather, which is becoming more frequent as the climate warms.³² New York's subway system, for example, is prone to flooding, leaving health care workers unable to commute when they are needed most.³³ Public transit also becomes particularly important when weather conditions make it impossible for those who normally walk or bike to work to do so.

HDOs may serve as anchor institutions — “nonprofit or public institutions firmly rooted in place, given their mission, invested capital, or customer relationships” — and can coordinate with other institutions and community members to support local transportation and development policies

²⁶ Morello-Frosch, R. and Obasogie, O. K., [The Climate Gap and the Color Line—Racial Health Inequities and Climate Change](#), *The New England Journal of Medicine* 2023, 388:943-949, March 9, 2023.

²⁷ Brenan, M., [Record High in U.S. Put Off Medical Care Due to Cost in 2022](#), Gallup, January 17, 2023.

²⁸ Mahajan, S. et al., [Trends in Differences in Health Status and Health Care Access and Affordability by Race and Ethnicity in the United States, 1999-2018](#), *Journal of the American Medical Association*, 326(7): 637-648, August 17, 2021.

²⁹ Artiga, S. et al., [Health Coverage by Race and Ethnicity, 2010-2021](#), Kaiser Family Foundation (KFF), December 20, 2022.

³⁰ Morello-Frosch, R. and Obasogie, O. K., [The Climate Gap and the Color Line—Racial Health Inequities and Climate Change](#), *The New England Journal of Medicine* 2023, 388:943-949, March 9, 2023.

³¹ Morello-Frosch, R. and Obasogie, O. K., [The Climate Gap and the Color Line—Racial Health Inequities and Climate Change](#), *The New England Journal of Medicine* 2023, 388:943-949, March 9, 2023.

³² U.S. EPA, [Understanding the Link Between Climate Change and Extreme Weather](#).

³³ Weintraub, A., [An Unhealthy Commute: The Transit Challenges Facing New York City's Healthcare Sector](#), Center for an Urban Future, January 2018.

that increase health care access, improve public health, and reduce emissions.³⁴ The nonprofit Health Care Without Harm lays out three potential models for greater community engagement and more equitable outcomes.³⁵ The CDC Foundation,³⁶ too, encourages HDOs to play a more active role in community leadership. In its Public Health Action Guide, the CDC Foundation suggests that Public Health Practitioners provide health-related data to transportation partners and identify opportunities for collaboration.³⁷ As community leaders, HDOs can take steps like those recommended for New York health care organizations by the non-profit Center for an Urban Future. These include forming a working group with local transit authorities; encouraging state and local governments to invest in late-night public transportation and security; improving communication with passengers; and investing in robust infrastructure resiliency to withstand extreme weather emergencies.³⁸

Finally, important equity considerations lie at the intersection of low-emissions transportation policies and health care. For example, while policies to encourage purchases of electric vehicles (EVs) can be an effective strategy for reducing emissions, not every patient and employee owns a car, particularly in urban areas. In fact, lower income people and people of color—who on average are most impacted by motor vehicle pollution and contribute least to it³⁹ — are more likely than the general population to rely on public transit or active transportation.⁴⁰

II. HDOs can reduce fleet emissions by leveraging new incentives

Emissions from vehicles owned by HDOs, such as ambulances, courier vehicles, supply trucks, and shuttles,⁴¹ fall under Scope 1 of the Greenhouse Gas Protocol, and several large health care

³⁴ Health Care Without Harm, [Anchored by Health Care: Strategies for Health Systems](#), May 2023.

³⁵ Ibid.

³⁶ The CDC foundation is an independent nonprofit authorized by Congress to support the CDC's mission (Centers for Disease Control and Prevention (CDC), [CDC Foundation](#), July 7, 2022).

³⁷ CDC Foundation, [Public Health Action Guide: Public Transportation](#).

³⁸ Weintraub, Arlene, [An Unhealthy Commute: The Transit Challenges Facing New York City's Healthcare Sector](#), Center for an Urban Future, January 2018.

³⁹ Velasco, G.abi, [How Transportation Planners Can Advance Racial Equity and Environmental Justice](#), Urban Institute, August 18, 2020.

⁴⁰ Anderson, M., [Who Relies on Public Transit in the U.S.](#), Pew Research Center, April 7, 2016.

⁴¹ Practice Greenhealth, [Fleet Vehicles](#).

networks have already taken steps to transition their fleets to EVs.⁴² Although fleet emissions are a small percentage of overall HDO GHG emissions, fleet vehicles can be a visible source of local air pollution in surrounding communities. The IRA includes provisions that make it easier for organizations, including nonprofits, to transition to EVs, and the IIJA includes provisions that improve the accessibility of infrastructure for EV-charging. There are also state-level policies HDOs can leverage to help underwrite costs and speed this transition. Financial incentives and state or utility initiatives to support charging infrastructure are important because many hospital electrical systems are not designed to accommodate the large loads from new EV charging infrastructure. Upgrading the systems to add multiple charging stations is costly and may require significant coordination with local government and electric utilities.⁴³

Examples of HDO Initiatives

Several HDO networks have already taken steps to decarbonize their fleets. The Veterans Health Administration (VHA), the largest integrated health care system in the United States,⁴⁴ has begun transitioning its 23,000-vehicle fleet to EVs.⁴⁵ The VHA requested that 507 conventional vehicles be replaced with electric vehicles through the General Services Administration's (GSA)⁴⁶ vehicle lease replacement process in 2022. The Department is also working on developing a charging

⁴² Research has shown that electric vehicles generally have a smaller carbon footprint than traditional gas-powered vehicles, even when accounting for the life cycle of their materials, and are better for local air quality (Congressional Research Service (CRS) [Environmental Effects of Battery Electric and Internal Combustion Engine Vehicles](#), June 16, 2020). This is particularly true in areas with cleaner electric grids, meaning EVs can improve as our grids do (Congressional Research Service (CRS) [Environmental Effects of Battery Electric and Internal Combustion Engine Vehicles](#), June 16, 2020; Tabuchi, H. and Plumer, B., ["How Green Are Electric Vehicles?"](#), New York Times, June 23, 2023). However, EVs still raise vital environmental justice issues. Cobalt, a mineral used in smartphone and laptop batteries, is used in EV batteries as well and largely imported from the Democratic Republic of Congo, where "artisanal miners," including children, work in "slave-like conditions" without specialized equipment in open-pit mines that frequently collapse (see Gross, Terry [NPR, February 1, 2023](#)). Lithium, another mineral used in EV batteries, is often sourced from South America, where mines have contaminated and depleted local communities' water supply (see [euronews.green](#), citing to [Friends of the Earth report](#)). While IRA tax credits for EV producers encourage domestic mining (IRA Sec 13401 Clean Vehicle Credit, (e)(1)(A)), there are concerns that these measures may simply import similar problems, particularly for Indigenous communities in the U.S. (See Mintzes, Aaron, [Harmful Mining Provisions in the Inflation Reduction Act](#), Earthworks Blog, August 4, 2022.) On the other hand, traditional internal combustion engine vehicles and the gas on which they run present similar environmental justice issues in both their production and use (see Washington Post ["Deadly air pollutant 'disproportionately and systematically' harms Americans of color, study finds"](#); Harvard T.H. Chan School of Public Health ["Fossil fuel extraction is harming Indigenous communities, say experts"](#); The Climate Reality Project ["The Environmental Injustice of Pipelines"](#)).

⁴³ Wardon, J., [Should hospitals add electric vehicle charging stations?](#), Healthcare Facilities Today, June 15, 2023.

⁴⁴ U.S. Department of Veterans Affairs, [About VHA](#), August 2, 2023.

⁴⁵ U.S. Department of Veterans Affairs, [Sustainability Plan](#), October 2022.

⁴⁶ The [General Services Administration](#) provides centralized procurement for the federal government.

infrastructure plan to complement the solar electric vehicle supply equipment (EVSE) it has installed at 34 Veteran Affairs Medical Centers (VAMCs).⁴⁷ The University of California San Francisco (UCSF) Health system is taking similar steps — 28% of the shuttle buses in its fleet are electric,⁴⁸ and 25% of the light duty vehicles acquired for UCSF in the 2021-2022 fiscal year were electric or hybrid.⁴⁹

Ambulances in particular present an opportunity for emissions reduction, since they often have long periods of idling during which they emit fine particles and other pollution in order to keep essential equipment running and ready for use.⁵⁰ In the U.S., only a small percentage of HDOs own and operate their own fleets of ambulances.⁵¹ Nevertheless, HDOs can engage the government agency, private business, or volunteer organization that provides emergency services in their area and communicate the potential health and environmental benefits of low-emission and zero-emission vehicles (ZEVs). Independent ambulance operators also can make changes to reduce emissions. For example, Northwell Health, an ambulance company in New York, has begun switching over its traditional ambulances to plug-in hybrid diesel-electric vehicles.⁵² The diesel engine shuts down if the ambulance is inactive for more than five seconds, at which point the electric battery provides power. Electricity from the battery can power essential equipment and can heat and cool the vehicle, all without running the engine.⁵³ This innovation has reduced emissions and has saved Northwell money on diesel fuel and vehicle maintenance.⁵⁴

Incentives for Low-Emissions Vehicles and Charging Infrastructure

Federal Incentives

At the federal level, the IRA and IIJA have changed the landscape for the transition to EVs. The key provision in the IRA for health care organizations looking to transition their fleets is the

⁴⁷ U.S. Department of Veterans Affairs, [Sustainability Plan](#), October 2022.

⁴⁸ Health Care Without Harm, [Climate Resilience for Health Care and Communities: Strategies and Case Studies](#), January 2022.

⁴⁹ UCSF, [2022 Sustainability Report](#).

⁵⁰ Health Care Without Harm, [Ambulances That Don't Idle Offer Savings and Less Emissions](#), June 4, 2021.

⁵¹ According to the National Association of Emergency Medical Technicians, only 7% of ambulances are hospital-based. See Calams, S., [What are the differences between public and private ambulance services?](#), EMS1, October 23, 2017.

⁵² Health Care Without Harm, [Ambulances That Don't Idle Offer Savings and Less Emissions](#), June 4, 2021.

⁵³ Ibid.

⁵⁴ Ibid.

Section 45W Credit for Qualified Commercial Clean Vehicles.⁵⁵ This section offers a credit of up to \$7,500 for vehicles under 14,000 pounds and up to \$40,000 for medium- and heavy-duty vehicles (those between 10,001-26,000 lbs. and greater than 26,000 lbs., respectively⁵⁶). The provision also applies to hydrogen fuel cell powered vehicles, which some experts believe is a viable option for long-haul trucking.⁵⁷ The credit is equal to the lesser of 15% of the owner's basis⁵⁸ in the vehicle (30% if not powered by gas or diesel) or the incremental cost of the vehicle.⁵⁹ The IRA updated the vehicle tax credit to provide for elective pay, which allows non-profit hospitals with no tax liability to take advantage of the tax-based incentives for ZEVs.⁶⁰ Through the elective pay option, these entities can receive a payment from the federal government for the value of the credit.

State Incentives

In addition to federal resources, HDOs may be able to look toward their state governments for support in fleet electrification and charging infrastructure.⁶¹ Some states offer more resources than others, as illustrated by the American Council for an Energy-Efficient Economy annual State Transportation Electrification Scorecard.⁶² The Scorecard includes a ranking of states based on their Incentives for EV Deployment. At the top of the list this year, California ranked first, followed

⁵⁵ IRS, [Commercial Clean Vehicle Credit](#), Updated December 26, 2023.

⁵⁶ [Vehicle Weight Classes & Categories](#), U.S. Department of Energy Alternative Fuels Data Center.

⁵⁷ Walker, T., [Why the future of long-haul heavy trucking probably includes a lot of hydrogen](#), Clean Air Task Force, March 14, 2023. The overall GHG benefits of using “green” hydrogen will depend on whether and how renewable electricity is used to produce the fuel. See Jenkins, J.D., [Biden admin's long-awaited hydrogen rules are here — and on the right track](#), Canary Media, December 22, 2023.

⁵⁸ “Owner’s basis” is the full capital expenditure for the vehicle.

⁵⁹ Commercial Clean Vehicle Credit, Internal Revenue Service, updated June 22, 2023.

⁶⁰ See IRS, [Elective pay and transferability](#), update December 28, 2023.

For a full list of elective pay provisions, see IRS, [Clean Energy Tax Incentives: Elective Pay Eligible Tax Credits](#), Publication 5817-G (6-2023).

⁶¹ There is a list of state incentive programs on the National Conference of State Legislatures (NCSL) website. See Igleheart, A., [State Policies Promoting Hybrid and Electric Vehicles](#), National Conference of State Legislatures, August 23, 2023.

⁶² American Council for an Energy-Efficient Economy (ACEEE), [2023 Transportation Electrification Scorecard](#), June 28, 2023.

by New York, with Massachusetts, Pennsylvania, and New Jersey tying for third.⁶³ Each of these states offers a rebate program of its own in addition to federal incentives.⁶⁴

While some rebate programs are only open to individuals, each of these states provides some incentives that apply to organizations. In Pennsylvania, for example, organizations can apply for Alternative Fuels Incentive Grants to cover the incremental costs of retrofitting vehicles to operate on alternative fuels, purchasing alternative fuel vehicles, and research, training, development, and demonstration.⁶⁵ Funding is prioritized for projects with ZEVs and for 501(c)3 tax exempt organizations, including those that provide medical services.⁶⁶ HDOs can turn to the Alternative Fuels Data Center State Laws and Incentives page, as well as the state web pages, to learn more about programs available in their state.⁶⁷

Engagement in EV Charging Infrastructure Programs and Policies

The IIJA includes two dedicated EV charging infrastructure funding programs. The first, a competitive Charging and Fueling Infrastructure grant program, provides \$2.5 billion in funding to be awarded to states, metropolitan planning organizations, public authorities, local governments, Indian tribes, or U.S. territories for the purpose of “strategically deploy[ing] publicly accessible⁶⁸” alternative fuel charging infrastructure, including for electric vehicles and hydrogen fuel cell vehicles.⁶⁹ Projects under this program may fall under the “corridor charging” track, if they are located along Alternative Fuel Corridors,⁷⁰ or fall under the “community

⁶³ Huether, P. et al., [2023 State Transportation Electrification Scorecard](#), American Council for an Energy-Efficient Economy (ACEEE), June 2023.

⁶⁴ [California Clean Vehicle Rebate Project](#), 2023. New York State Energy Research and Development Authority (NYSERDA), [Drive Clean Rebate for Electric Cars](#), 2023. [Massachusetts Offers Rebates for Electric Vehicles \(MOR-EV\)](#), 2023. New Jersey Department of Environmental Protection, [Drive Green New Jersey](#), June 9, 2023. Pennsylvania Department of Environmental Protection, [Alternative Fuel Vehicle Rebates for Consumers](#), 2023.

⁶⁵ Pennsylvania Department of Environmental Protection (DEP), [Alternative Fuels Incentive Grants](#), 2023.

⁶⁶ Ibid.

⁶⁷ U.S. Department of Energy Alternative Fuels Data Center, [State Laws and Incentives](#).

⁶⁸ Specifically, these projects must be “located on any public road or in other publicly accessible locations, such as parking facilities at public buildings, public schools, and public parks, or in publicly accessible parking facilities owned or managed by a private entity.” (IIJA Subtitle D, Sec. 11401 (f)(8)(E)).

⁶⁹ Minott, Owen and Barry, Erin, [A Status Update on EV Charging Infrastructure Investments in the IIJA](#), Bipartisan Policy Center, July 26, 2022; IIJA Title I, Subtitle D, Sec. 11401 Grants for Charging and Fueling Infrastructure

⁷⁰ Alternative Fuel Corridors are portions of the Interstate Highway System nominated by the states and approved by the Federal Highway Administration for the installation of alternative fueling infrastructure (Federal Highway Administration (FHWA), [Alternative Fuel Corridors](#), May 19, 2023).

charging” track if they are located on public roads or in schools, parks, and in publicly accessible parking facilities.⁷¹ The grants prioritize projects located in low- and moderate-income neighborhoods, rural areas, and communities with relatively few private parking spaces or many multi-unit dwellings.⁷² Publicly-owned HDOs⁷³ with publicly accessible parking lots (with no parking fee⁷⁴), especially those located in disadvantaged or rural communities, may have a particular opportunity to benefit from the Charging and Fueling Infrastructure Grant Program if projects are pursued in cooperation with a local public authority.⁷⁵ HDOs that don’t meet these criteria may consider coordinating with a local public authority to prioritize siting of charging infrastructure in a publicly accessible lot near essential services like health care.

The second major provision is the National Electric Vehicle Infrastructure (NEVI) Formula Program, which sets aside \$5 billion to help states “strategically deploy EV charging infrastructure.” EV charging must be open to the public or authorized commercial vehicle operators from more than one company and must be located along Alternative Fuel Corridors, which are designated strategic locations along national highways.⁷⁶ Although this funding source is not directly accessible to HDOs, it will contribute to broader use and acceptance of EVs and, in the long run, lower the overall carbon footprint of HDO staff and patients. In addition, HDOs may be able to engage with their states in developing NEVI plans that can benefit HDOs as NEVI encourages robust stakeholder participation and requires annual reporting on public engagement activities undertaken to develop state plans.⁷⁷

⁷¹ U.S. Department of Transportation, [Charging and Fueling Infrastructure Grant Program](#), August 2, 2023.

⁷² Minott, Owen and Barry, Erin, [A Status Update on EV Charging Infrastructure Investments in the IIJA](#), Bipartisan Policy Center, July 26, 2022; IIJA Title I, Subtitle D, Sec. 11401 Grants for Charging and Fueling Infrastructure

⁷³ About 15% of Medicare-enrolled hospitals are government owned (Assistant Secretary for Planning and Evaluation (ASPE) Office of Health Policy, [Ownership of Hospitals: An Analysis of Newly-Released Federal Data & A Method for Assessing Common Owners](#), August 2023).

⁷⁴ Federal Highway Administration (FHWA), [Charging and Fueling Infrastructure \(CFI\) Competitive Grant Program Q & A](#), May 5, 2023.

⁷⁵ Note that rural hospitals may be more likely to have free parking and the space to accommodate EV-charging stations.

⁷⁶ Federal Highway Administration (FHWA), [National Electric Vehicle Infrastructure \(NEVI\) Program](#), June 21, 2023; IIJA Division J, Title VIII, Highway Infrastructure Program heading. List: Federal Highway Administration (FHWA), [All Designated Corridors by State](#), July 5, 2022.

⁷⁷ U.S. Department of Transportation, Federal Highway Administration, [National Electric Vehicle Infrastructure \(NEVI\) Formula Funding Q&A](#).

III. HDOs can encourage freight vehicle decarbonization

Addressing greenhouse gas and particulate pollution emissions from freight is an essential part of reducing the health care sector's environmental impact and protecting surrounding communities from air pollution and its associated health harms. In 2023, 20,302 million tons of freight, with a total value of \$20,328 billion was shipped in the U.S., much of it by truck.⁷⁸ Twenty-three percent of U.S. transportation emissions are from medium- and heavy-duty trucks, and the U.S. freight transportation sector is projected to grow 45% by 2040.⁷⁹

Emissions from freight are a significant part of HDOs' Scope 3 emissions. Truck transportation is the 5th largest category contributing to health care GHG emissions overall,⁸⁰ responsible for 4.8% of healthcare sector emissions (see red bar in Figure 2).⁸¹ Most trucks that carry freight are powered by diesel engines, which emit harmful fine particle pollution and have outsized impacts on the air quality of communities that live near highways and other major roadways. These communities disproportionately include low-income people and people of color.⁸²

⁷⁸ U.S. Department of Transportation (DoT) Bureau of Transportation Statistics, [Freight Facts and Figures: Moving Goods in the United States](#), 2022.

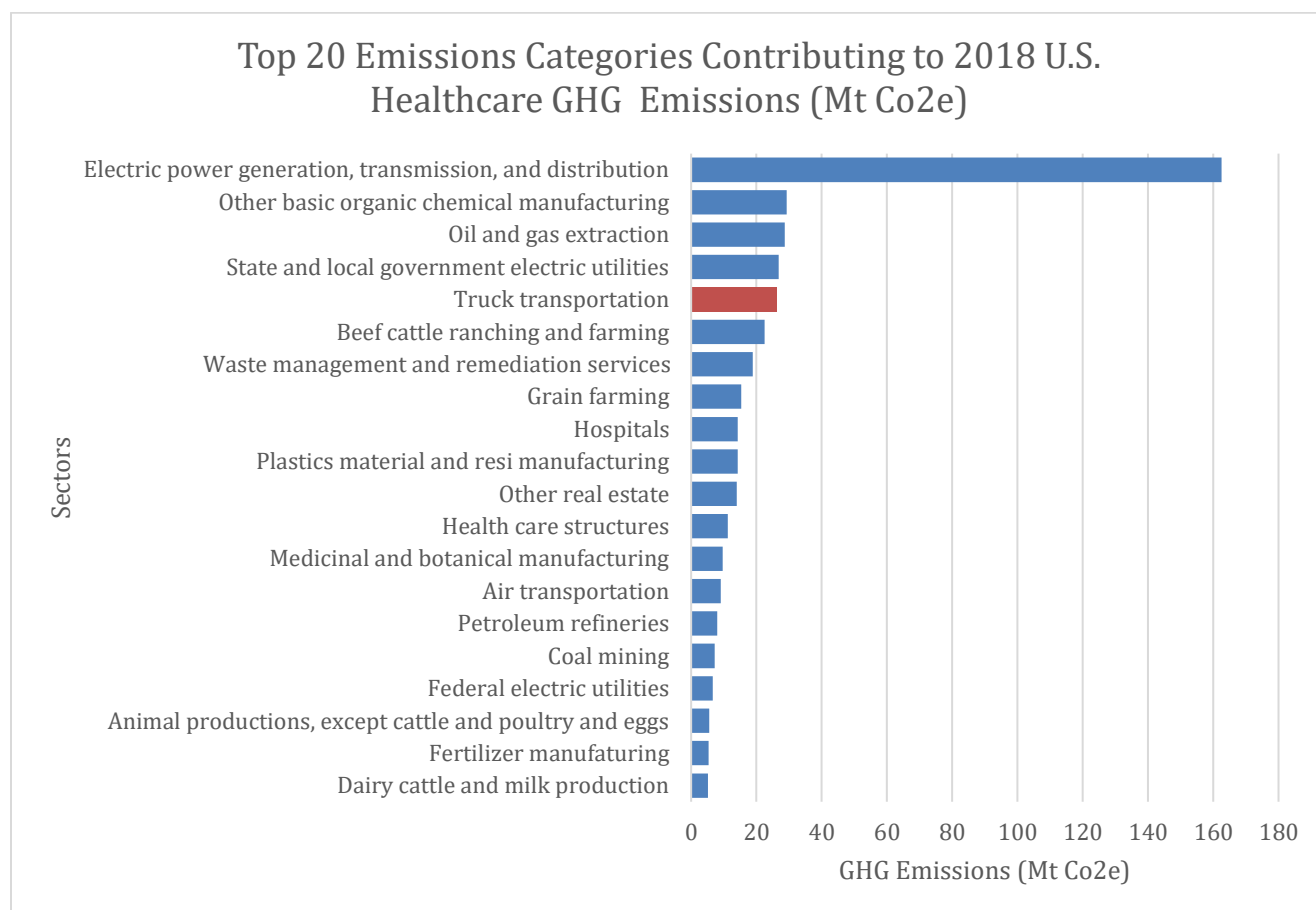
⁷⁹ EPA, [Why Freight Matters to Supply Chain Sustainability](#), updated May 31, 2023.

⁸⁰ Georgetown Climate Center (GCC), [Decarbonizing Health Care: Clean Energy Policy Options](#), April 2023, p. 2.

⁸¹ Eckelman, et al. op. cit. Data is from [Appendix](#) Exhibit A10.

⁸² EPA, [Environmental Justice & Transportation](#), updated April 12, 2023.

Figure 2: Emissions Categories Contributing to U.S. Health Care GHG Emissions⁸³



Voluntary Partnerships and Incentive Programs for Low-Emissions Freight

EPA SmartWay Program

HDOs can take steps to reduce transportation emissions from their suppliers through participation in voluntary initiatives. For example, EPA sponsors SmartWay, a public-private program that “helps companies identify and select more efficient freight carriers, transport modes, equipment, and operational strategies to improve supply chain sustainability.”⁸⁴ Shippers, carriers, and logistics companies can all join the nearly 4,000 registered SmartWay

⁸³ Eckelman et al. op. cit. Data is from Appendix Exhibit A10.

⁸⁴ EPA, [Learn About Smartway](#), November 21, 2022.

Partners for free by completing five steps, guided by EPA’s sustainability accounting and tracking tools: measuring supply chain footprint, benchmarking performance, reporting results, innovating operations, and improving efficiency.⁸⁵ In return, Partners receive environmental performance data, access to detailed reports on their own efficiency in comparison to peers, documentation of their performance, and rights to use the SmartWay logo.⁸⁶ Practice Greenhealth suggests HDOs increase the percentage of EPA SmartWay partners amongst their top 10 distributors (by annual expenditure) to 80% or greater.⁸⁷ Depending on the purchasing practices in place, hospitals can either directly require their supplies to be delivered via an EPA SmartWay Shipper or Carrier Partner, or ask their Group Purchasing Organization (GPO) to do so.⁸⁸

State Incentive Programs

Several states have optional incentive programs for truck manufacturers and operators. For example, under the California Air Resources Board (CARB) [Clean Truck Partnership](#), some truck manufacturers and the Truck and Engine Manufacturer’s Association have agreed to meet the CARB’s zero-emission and pollutant regulations in exchange for the CARB agreeing to align with the EPA’s NOX emissions standards for 2027, modify its own 2024 NOX standards, and provide at least “four years lead time and at least three years of regulatory stability before imposing new requirements.”⁸⁹ New York has the New York Truck Voucher Incentive Program (NYTVIP), which provides vouchers to fleets across the state that purchase or lease medium-and heavy-duty electric or hydrogen fuel cell power vehicles. The program, administered by the New York State Energy Research and Development Authority (NYSERDA), is designed to create incentives to remove the oldest and highest emitting diesel engines from New York roads. Voucher amounts are “based on a percentage of the incremental cost of the vehicle, which is the difference in cost between the zero-emission vehicle and a comparable diesel vehicle, up to a per-vehicle cap.”⁹⁰ Trucking industry cooperation with initiatives such as these will indirectly reduce HDO Scope 3 emissions by reducing emissions in the freight transportation sector overall.

⁸⁵ EPA, [How the SmartWay Partnership Works](#), Updated March 16, 2023.

⁸⁶ Ibid.

⁸⁷ Practice Greenhealth, [Get Moving With Innovative Transportation](#).

⁸⁸ Practice Greenhealth, [Transportation: Supply Chain Options to Reduce the Impacts from Freight](#).

⁸⁹ CARB [CARB and Truck and Engine Manufacturers Announce Unprecedented Partnership to Meet Clean Air Goals](#), July 6, 2023.

⁹⁰ New York State Energy Research & Development Authority (NYSERDA), [New York Truck Voucher Incentive Program](#).

Broader Policy Engagement in Truck Emissions Standards

HDOs are frequently among the largest employers and economic drivers in state and local economies. Health care organizations can leverage that status to encourage positive policy change by contributing their expertise to public hearings and comments on future emissions standards for trucks. HDOs can also take on a leadership role in state-level conversations on whether to adopt the CARB's policies, which are typically more robust than the federal default set by the EPA.

Federal (EPA)

The EPA Clean Trucks Plan includes two components of potential interest to HDOs looking to reduce their freight-related emissions.⁹¹ The Final Rule and Related Materials for “Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards⁹²” is focused on improving air quality, particularly through reductions in nitrous oxides (NOX), which form ozone and dangerous particulate matter pollution. This rule, which applies to Model Year (MY) 2027 and later, will reduce NOX emissions by about 50% in 2045, and is expected to generate \$200 billion in health-related benefits from 2027-2045. This includes reductions in premature deaths, hospital admissions and emergency department visits, cases of asthma onset in children and of asthma and hay fever symptoms, and lost days of school and work.

The other relevant component of the plan, Proposed Rule: Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3⁹³, is a proposed update to the Final Rule for Phase 2 Greenhouse Gas Emissions Standards for Medium- and Heavy-Duty Engines and Vehicles.⁹⁴ Phase 3 will maintain Phase 2's basic structure but impose more stringent requirements on medium- and heavy-duty vehicle manufacturers based on advancements in clean vehicle technology and markets and incentives now available through the IRA and IIJA. These regulations set CO2 emissions limits in grams per ton-mile, which manufacturers can meet using technology of their choice, including a mix of internal combustion engine (ICE) vehicles and ZEVs. The regulations also include science-based “technology packages” that break down how manufacturers might be able to meet these targets, as well as projected ZEV adoption rates. The rule allows for both EVs and vehicles powered by clean hydrogen fuel cells.⁹⁵ Projected adoption rates for MY 2032 range

⁹¹ U.S. EPA, [Clean Trucks Plan](#), updated April 12, 2023.

⁹² U.S. EPA, [Final Rule and Related Materials for Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards](#) January 2023.

⁹³ U.S. EPA, [Proposed rule: Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3](#), April 12, 2023.

⁹⁴ U.S. EPA, [Final Rule for Phase 2 Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles](#), October 26, 2016.

⁹⁵ As discussed earlier in the paper, the economic, technological, and environmental advantages of EVs vs. hydrogen fueled vehicles for long-haul trucking is still under debate. See note 55.

from 15% to 57%, depending on the vehicle type.⁹⁶ Overall, the EPA's proposed Greenhouse Gas Emissions Standards for Heavy-Duty Trucks — Phase III are estimated to reduce GHG emissions by about 29% and fine particle emissions by 36% by the year 2050.

In general, health advocacy organizations have supported the Phase 3 proposal. American Lung Association and nine other medical and public health organizations signed on to a letter in support of the proposal,⁹⁷ and several have testified in support of even stronger regulations.⁹⁸ Similarly, a group of Democratic lawmakers wrote a letter asking the EPA to match the standards in California's Clean Truck Partnership program.⁹⁹ The final rule is currently expected in March 2024¹⁰⁰.

California Vehicle Emissions Standards

At the state level, the California Air Resources Board (CARB) has its own vehicle emissions standards, which other states can choose to adopt, as allowed by an exception under the Clean Air Act. The CARB [Advanced Clean Trucks Regulation](#) has two components. The first sets percentages of zero-emission truck sales that manufacturers are required to meet by 2035, ranging from 40% to 75% depending on vehicle type. The second component requires large employers and fleet owners with fifty or more trucks to report information about their operations and services. The CARB also regulates fleet operators through its [Advanced Clean Fleets](#) program. The regulations vary based on whether the fleet operator is a "high-priority fleet" with either more than 50 trucks or belonging to companies that make more than \$50 million in annual revenue (which may include some fleet operators on whom HDOs rely), a drayage truck fleet with trucks that operate at ports or railyards, or a public fleet.¹⁰¹ The milestones the CARB has set for each type of fleet, which include requirements for new ZEV purchases and retiring old ICE vehicles, are designed to contribute to the state goal of 100% zero-emission vehicles by 2045.¹⁰² In 2022, CARB updated its Transportation Refrigeration Unit (TRU) regulations to require the use of a refrigerant with lower global warming potential and to add a particulate matter emission standard.¹⁰³ The CARB updated these regulations again in 2023 to include a zero-emission fleet

⁹⁶ U.S. EPA, [Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles: Phase III, Regulatory Impact Analysis](#), April 2023, p. 247.

⁹⁷ American Lung Association et al., Dec 6, 2023: "[Approve Strong Phase 3 Truck Standards without Delay](#)", December 6, 2023.

⁹⁸ U.S. EPA, [EPA Hearing Transcript of Day 1](#), May 2, 2023; EPA, [EPA Hearing Transcript of Day 2](#), May 3, 2023.

⁹⁹ Anthony Padilla Senate, [Congressional Letter](#), September 5, 2023.

¹⁰⁰ Office of Information and Regulatory Affairs (OIRA), [Reginfo.gov](#), [View Rule \(RIN: 2060-AV50\)](#).

¹⁰¹ RMI [Understanding California's Advanced Clean Fleet Regulation](#), July 3, 2023.

¹⁰² Ibid.

¹⁰³ CARB [Transportation Refrigeration Unit \(TRU or Reefer\) Regulation](#).

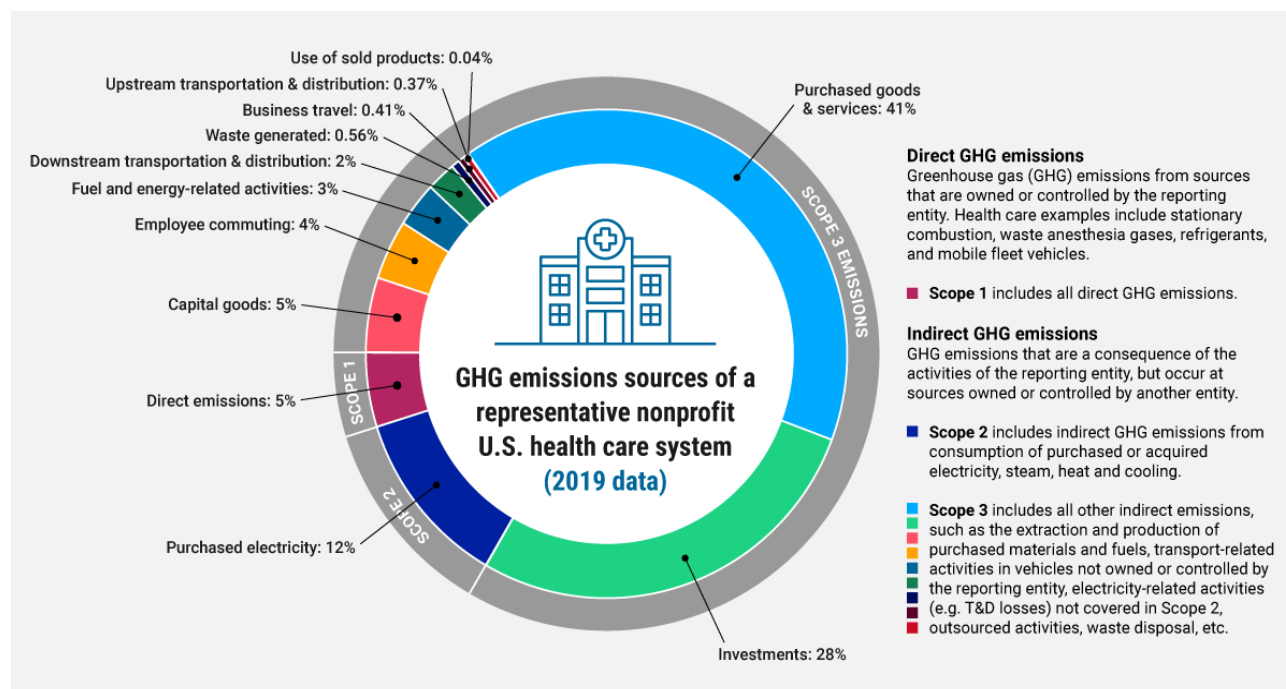
requirement of 15% per year increase beginning in 2023, with a requirement that 100% of the fleet is zero emission by 2029.

IV. HDOs can support low-emission commuting options and expand opportunities for telehealth care

Background

Within the health care sector, employee commuting accounts for approximately 4% of GHG emissions for a typical non-profit health care system (see the yellow wedge in Figure 3). There are three main methods HDOs can pursue to reduce reliance on fossil-fuel-powered vehicles among their workforce: provide lower-emissions motor vehicle transportation, offer incentives for public transportation and carpooling, and establish programs to encourage active transportation. The most viable options will depend on the location of the HDO and the nature of the services they provide, but in many cases, pursuing some combination of these three pathways can help maximize emissions reductions and employee accessibility. HDOs can also improve patient access to health care while reducing emissions from transportation and readmission through creative telehealth programs.

Figure 3: Health care Emissions by GHG Protocol Scope¹⁰⁴



Internal Commuting Policies

On-Site Charging for EVs

Several hospital systems have already instituted programs to make it easier for employees to switch to zero-emissions electric vehicles. For example, with the help of funding from the New York State Energy Research and Development Authority (NYSDERDA) and U.S. Department of Energy (DOE) Clean Cities Organizations, the Buffalo Niagara Medical Campus has installed a total of 21 free electric vehicle charging stations at four locations, with about half reserved for employees.¹⁰⁵ Massachusetts General Hospital (Mass General) and University of California (UC) Health have installed EV charging stations in their parking lots, and 20% of UC Health's commuter population now drive hybrid or electric vehicles to work.¹⁰⁶

¹⁰⁴ Graphic is from Practice Greenhealth, [Scope 3 GHG Emissions Accounting Tool](#). Note that the percentages for the three scopes are estimates based on only one non-profit health care system. These percentages are slightly different from the sector-wide percentages estimated by Eckelman et al. op. cit. and discussed elsewhere in this paper. Note that the percentages for the three scopes are estimates based on a typical non-profit health care system.

¹⁰⁵ New York State Energy Research and Development Authority (NYSDERDA), [Charging Stations at Buffalo Niagara Medical Campus](#), April 2015.

¹⁰⁶ Health Care Without Harm Health Care Climate Council, [Climate Action: A Playbook for Hospitals](#), July 2020.

Incentives for Carpooling and Public Transit

Hospital systems can reduce single occupancy vehicle (SOV) commuting among their employees by making it more expensive to park SOVs and less expensive to carpool. For example, Seattle Children's "reduced drive-alone commute trips made by their workforce from 73% in 1995 to 32.5% in 2017"¹⁰⁷ by charging daily parking rates that differ by location and time of day while offering free, premium vanpool parking and a daily commute bonus on days staff do not drive alone.¹⁰⁸ UC Health has reduced SOV commuting to 26.2% in 2018 with a similar set of policies and incentives.¹⁰⁹

HDOs in areas with public transit networks can also incentivize employees to take advantage of public transit. Mass General Brigham, for example, provides employees monthly Massachusetts Bay Transportation Authority (MBTA) pass subsidies of 35% to 50%, and 50% of their staff use public transit.¹¹⁰ Seattle Children's similarly provides employees with discounted public transit passes, but also offers a commute bonus for utilizing public transit, active transit, or carpooling and provides personalized commute planning to every new employee.¹¹¹ Providence's Swedish Health Services provides a guaranteed ride home via taxi 8 times per year for employees who have a smart card for public transit in the Puget Sound region of Washington state.¹¹² This provides backup service for employees if public transportation is not available.

Incentives and Accommodations for Active Transportation

For employees who live nearby, HDOs can encourage them to utilize active transportation, such as walking or biking to work, and encourage their local governments to invest in making streets safer for active commuters. This has the added benefit of improving employees' health and well-being while reducing GHG and local emissions.¹¹³ UC Health and Providence provide bike parking

¹⁰⁷ Ibid.

¹⁰⁸ Seattle Children's, [About Seattle Children's Sustainability Program](#).

¹⁰⁹ Health Care Without Harm Health Care Climate Council, [Climate Action: A Playbook for Hospitals](#), July 2020.

¹¹⁰ Ibid.

¹¹¹ Ibid. Also see Seattle Children's, [Seattle Children's Employee Benefits](#).

¹¹² See [Environmental Stewardship – Transportation and Commuting Efforts](#), linked in Schenk, B., [Environmental Stewardship – WE ACT for Transportation](#), Providence Blog, February 4, 2021.

¹¹³ Raifman, M. et al., [Mortality Implications of Increased Active Mobility for a Proposed Regional Transportation, Emission Cap-and-Invest Program](#), Journal of Urban Health, 98, 315-327, January 20, 2021; Centers for Disease Control and Prevention (CDC), [Physical Activity: Why It Matters](#), May 13, 2020.

and shower facilities for employees,^{114 115} and Seattle Children's offers the free use of a bike (as well as two free annual tune-ups at a full-service on-site bike shop) for employees who commit to biking to work twice a week.¹¹⁶

Finally, Providence has developed several programs to reduce SOV commuting for employees, including subsidies for carpools, biking, and public transportation; bike lockers and showers; and prizes or other recognition for employees who don't use SOVs.

Policies and Programs for Patients

Transportation Options

While HDO policies regarding parking fees and incentives for carpooling may not apply to patients, HDOs can make EV charging infrastructure accessible to patients and visitors. Similarly, while it is not always possible or desirable for patients to use active transportation to health care, facilities like UC Health's bike parking could help those who do want to bike to appointments.¹¹⁷

Several HDO networks have worked with local governments to improve transportation options. Seattle Children's Hospital worked with the city & county on transit improvements¹¹⁸ and Massachusetts General Hospital sponsored Boston's Bike Share program.¹¹⁹ HDOs also can work with state and local governments to make public transit and active transportation more affordable and safer for those who already rely on these methods, and a more attractive option for those who currently drive. For example, New York City and Los Angeles have implemented a "fare-capping" policy for public transit, which ensures that passengers never pay more in a week or month than they would if they had bought an up-front pass. Measures like this can help patients who rely on public transit have better and more affordable access to health care.¹²⁰ More generally, HDOs can urge state and local governments to improve access to low-emission transit by adopting a "big-picture" view of the importance of patterns of development. Poorly designed zoning regulations can encourage sprawl and increase vehicle miles traveled. On the other hand, well-designed zoning laws can lead to pedestrian- and public transit-friendly land use patterns. State, regional, and local governments can adopt zoning regulations and devote funding

¹¹⁴ Health Care Without Harm Health Care Climate Council, [Climate Action: A Playbook for Hospitals](#), July 2020.

¹¹⁵ See [Environmental Stewardship – Transportation and Commuting Efforts](#), linked in Schenk, B., [Environmental Stewardship – WE ACT for Transportation](#), Providence Blog, February 4, 2021.

¹¹⁶ Seattle Children's, [About Seattle Children's Sustainability Program](#).

¹¹⁷ Health Care Without Harm Health Care Climate Council, [Climate Action: A Playbook for Hospitals](#), July 2020.

¹¹⁸ Ibid.

¹¹⁹ Ibid.

¹²⁰ Weintraub, Arlene, [An Unhealthy Commute: The Transit Challenges Facing New York City's Healthcare Sector](#), Center for an Urban Future, January 2018.

to promote transit-oriented development that encourages the siting of businesses and essential services near pedestrian-friendly neighborhoods with affordable homes and sidewalks, bike lanes, and public transit corridors.¹²¹ HDOs can participate in public hearings and other local planning processes to ensure efficient and affordable access to health care is considered.

Telehealth Programs

Another approach to reducing patient emissions is to treat patients at home through telehealth services.¹²² Although there are gaps in the research about the emission reduction benefits of telehealth services, on the whole, research indicates telehealth leads to a net reduction in emissions.¹²³ As discussed below, telehealth not only saves on direct patient transportation and associated costs, but also can increase access to preventative care, reducing the need for energy-intensive emergency services.

For example, the Queen Anne's County Mobile Integrated Community Health (MICH) Program, which connects patients in a rural area to health care providers by phone and video telehealth (as well as through in-person visits), helped reduce emergency room visits and hospital readmissions for the program's 233 enrollees, saving \$3,393,908 in health care costs.¹²⁴ Similarly, in North Carolina, the Center for Rural Health Innovation (CRHI), with funding from the Health Resources and Services Administration (HRSA), partnered with health care providers to create the Health-e-Schools program.¹²⁵ This program connects rural children with health care resources at school using video conferencing telehealth.¹²⁶ The program was found to increase access to health care, increase school attendance, and "decrease the time parents or guardians needed to take off work to bring their child to health-related appointments."¹²⁷ In rural Virginia, the Bay

¹²¹ Federal Transit Administration (FTA), [Transit-Oriented Development](#), August 8, 2023.

¹²² Note: Although the terms are frequently used interchangeably, telemedicine refers specifically to the use of technology to provide remote clinical services, while telehealth includes telemedicine, as well as remote nonclinical services, such as provider training, administrative meetings and continuing medical education. See Schadelbauer, R., Anticipating Economic Returns of Rural Telehealth, NTCA-The Rural Broadband Association, March 2017.

¹²³ Purohit, A. et al., Does Telemedicine Reduce the Carbon Footprint of Healthcare? A Systematic Review, *Future Healthcare Journal*, March 2021; 8(1): e85–e91; Ravindran, R. and Patel, J., The Environmental Impacts of Telemedicine in Place of Face-to-Face Patient Care: A Systematic Review, *Future Healthcare Journal*, March 2022; 9(1): 28–33. It also should be noted that telehealth itself produces emissions through the electricity required to operate, the environmental impact of the necessary equipment, and in cases where patients are required to receive the telehealth care outside of their homes, its own transportation emissions.

¹²⁴ Rural Health Information Hub (RHInhub), [Queen Anne's County Mobile Integrated Community Health \(MICH\) Program](#), April 4, 2023.

¹²⁵ Rural Health Information Hub (RHInhub), [Health-e-Schools](#), October 27, 2022.

¹²⁶ Ibid.

¹²⁷ Ibid.

Rivers Telehealth Alliance (BRTA) partnered with two hospitals to enroll discharged patients in a remote telemonitoring project, and found the program reduced readmission rates.¹²⁸ HDOs looking to participate in similar projects can look to the National Consortium of Telehealth Resource Centers, which is funded by HHS and administered through HRSA, and provides free resources for telehealth program development and sustainability.¹²⁹

Telehealth can also facilitate communication and information-sharing between providers without in-person travel. Project ECHO (Extension for Community Healthcare Outcomes), for example, is a mentoring model that helps healthcare providers learn from one another, particularly for rural primary care providers learning from disease-specific specialists.¹³⁰ The Project was founded to address Hepatitis C care in rural New Mexico and was able to reduce the patient wait time for a Hepatitis C clinic from eight months to two weeks by educating more providers through telehealth.¹³¹

Telehealth Law & Policies

Federal

Federal policies have made it easier for providers to offer and be reimbursed for telemedicine/telehealth. The federal government has extended some of the telehealth policies that were in effect during the public health emergency caused by the COVID-19 pandemic. The Consolidated Appropriations Act of 2021 eliminated geographic and site-originating restrictions for telemental health care. Patients are still required to see their provider in-person six months before transitioning to online care, as well as having one in-person visit per year after that).¹³² Additionally, the Consolidated Appropriations Act of 2023 extended some telehealth flexibility waivers for Medicare through 2024.¹³³ This includes audio-only coverage, the suspension of geographic restrictions for both patients and providers, and the expanded list of eligible providers and services.¹³⁴

¹²⁸ Rural Health Information Hub (RHIfhub), [Bridges to Care Transitions-Remote Home Monitoring and Chronic Disease Self-Management](#), June 14, 2018.

¹²⁹ [National Consortium of Telehealth Resource Centers](#).

¹³⁰ Rural Health Information Hub (RHIfhub), [Project ECHO—Extension for Community Healthcare Outcomes](#), October 4, 2022.

¹³¹ Ibid.

¹³² LaRosa, Josh, [Avoiding the Cliff: Medicare Coverage of Telemental Health and the end of the PHE](#), Commonwealth Fund, March 23, 2022.

¹³³ U.S. Department of Health and Human Services (HHS), Telehealth.HHS.gov, [Medicare payment policies](#), May 11, 2023.

¹³⁴ Ibid.

The IIJA has provisions that expand the broadband access that is necessary for video telehealth, which is more carbon-intensive but also more effective than audio-only telehealth.¹³⁵ Telehealth has the potential to increase health care access and decrease transportation emissions for people in rural areas who have to travel the farthest to receive health care. Yet that same population disproportionately lacks access to telehealth, — 39% of rural Americans (compared to 10% of Americans overall) don't have the high-quality broadband access necessary for telehealth.¹³⁶ For indigenous people living on tribal lands, this is an even bigger problem, with 41% lacking the necessary broadband access.¹³⁷ In Grants for Broadband Deployment, the IIJA aims to fix this problem. It requires the Assistant Secretary of Commerce for Communications and Information to establish a Broadband Equity, Access, and Deployment Program to make grants “to bridge the digital divide.”¹³⁸

State

States have also enabled telehealth by amending insurance coverage and licensing requirements. These requirements are in flux as states revisit pandemic era policies following the official end of the COVID-19 public health emergency, but several state legislatures have already taken action to update their telemedicine requirements¹³⁹ and overcome interstate licensing issues.¹⁴⁰ States set reimbursement policies for Medicaid and have some power to regulate private insurers.¹⁴¹ HDOs can encourage states to require insurers to cover telemedicine, provide parity in patient cost sharing and provider reimbursement between in-person and telehealth appointments, and cover audio-only appointments as well as video appointments.¹⁴² Coverage of audio-only services

¹³⁵ Purohit, A. et al., Does Telemedicine Reduce the Carbon Footprint of Healthcare? A Systematic Review, *Future Healthcare Journal*, March 2021; 8(1): e85–e91; citing to Capampangan DJ, Wellik KE, Bobrow BJ, et al.. Telemedicine versus telephone for remote emergency stroke consultations: A critically appraised topic. *Neurologist* 2009;15:163–6.

¹³⁶ Rural Health Information Hub (RHInhub), [Telehealth](#), June 4, 2019; Federal Communications Commission (FCC), [2016 Broadband Progress Report](#), January 29, 2016.

¹³⁷ Federal Communications Commission (FCC), [2016 Broadband Progress Report](#), January 29, 2016.

¹³⁸ IIJA, Sec. 60102 (b)(1).

¹³⁹ Volk, JoAnn, O'Brien, Madeline, and Goe, Christine L., [State Telemedicine Coverage Requirements Continue to Evolve](#), Commonwealth Fund, December 20, 2022.

¹⁴⁰ Center for Connected Health Policy (CCHP), [Medicaid & State Telehealth Policy: State Licensure](#), June 2022 (YouTube video) - Lisa Robin from Federation of State Medical Boards and Janet Orwig from Association of State and Provincial Psychology Boards.

¹⁴¹ Center for Connected Health Policy (CCHP), [State Telehealth Laws and Reimbursement Policies](#) Spring 2023; Commonwealth Fund [States' Actions to Expand Telemedicine Access During COVID-19 and Future Policy Considerations](#) – [Appendices](#).

¹⁴² Commonwealth Fund, [Appendices - States' Actions to Expand Telemedicine Access During COVID-19 and Future Policy Considerations](#), June 2021.

is particularly important for health care equity since low-income people and people of color disproportionately lack access to live video services.¹⁴³ Finally, states can alter licensing requirements to make it easier for health care providers to provide telehealth care to patients across state lines by taking part in interstate compacts for Medical Doctor (MD), Physician's Assistant (PA), and mental health professional licensure. Additional options include participating in a universal or regional licensure program and expanding exceptions to licensure requirements.¹⁴⁴

V. Equity and Environmental Justice Programs for Communities

Several provisions of the IRA and IIJA are geared toward assisting underserved communities and have the potential to reduce pollution from transportation in communities while increasing access to health care in a sustainable way. More generally, engaging with communities in zoning and transportation planning can improve access to health care and reduce emissions in communities. There is also an opportunity for health care organizations to partner with community groups on community-based air quality monitoring initiatives.

Programs in the IRA

The Neighborhood Access and Equity Grant Program, Section 60501 of the IRA,¹⁴⁵ provides \$1.893 billion to the Federal Highway Administration to distribute in competitive grants to eligible entities:

- for planning and capacity-building activities in disadvantaged or underserved communities;
- to identify, monitor, or assess local and ambient air quality, emissions of transportation GHGs, extreme heat and pollution hot spots, gaps in tree coverage, or flood prone transportation infrastructure;
- to assess transportation equity or pollution impacts and develop local anti-displacement policies and community benefit programs;

¹⁴³ Center for Connected Health Policy (CCHP), [Medicaid & State Telehealth Policy: State Licensure](#), June 2022 (YouTube video) - Brian Hasselfeld from Johns Hopkins Medicine.

¹⁴⁴ Center for Connected Health Policy (CCHP), [Medicaid & State Telehealth Policy: State Licensure](#), June 14, 2022 (YouTube video) - Lisa Robin from Federation of State Medical Boards and Janet Orwig from Association of State and Provincial Psychology Boards.

¹⁴⁵ The White House, [Building a Clean Energy Economy: A Guidebook to the Inflation Reduction Act's Investments in Clean Energy and Climate Action](#) - The White House, January, 2023, Version 2, p. 88.

- for monitoring predevelopment activities for eligible projects;
- to expand public participation in transportation planning by individuals and organizations in disadvantaged or underserved communities; and
- to provide technical assistance.¹⁴⁶

While HDOs are not themselves eligible parties, under this provision, state and local governments and public agencies can partner with a nonprofit or institute of higher education (including, potentially, HDOs who may meet these criteria).¹⁴⁷ HDOs who are involved in such efforts should consider adopting the approaches advocated by the nonprofit organization Smart Growth America, which emphasizes the importance of “prioritiz[ing] historically underrepresented communities in transportation decision-making, work[ing] in unison to provide people-focused infrastructure, and invest[ing] in communities without displacement.”¹⁴⁸

The IRA, along with the American Rescue Plan (ARP), passed in 2021, also provide funding for community air quality monitoring projects in which HDOs can participate (discussed below).

Programs in the IIJA

The IIJA authorizes additional funding for the Enhanced Mobility of Seniors & Individuals with Disabilities program (Section 5310 of the Federal Public Transportation Act of 2012), which provides formula funding to states based on their population of older adults and people with disabilities for programs that expand transportation mobility options.¹⁴⁹ It specifically allows state and local authorities to partner with private non-profits as sub-recipients.¹⁵⁰ Of the \$8.4 million in grants distributed in Fiscal Year (FY) 2021 and 2022, several programs involved HDOs. In Georgia, the organization G1VE Atlanta received funding to coordinate rides to and from organizations including public and private mental health institutions; the Missouri Rural Health Association received funding in part to increase collaboration between health and transportation providers; and Summit County in Utah received funding to partner with both the health

¹⁴⁶ Eligible entities include states and their political subdivisions, local governments, entities described in 207(m)(1)(E), US territories, special purpose districts or public authorities with a transportation function, or metro planning organizations, or (for (a)(3)) a nonprofit or institution of higher education in partnership with one of the previous entities). (IRA Subtitle E Sec. 60501 § 177(b)). 207(m)(1)(E) refers to “Indian Tribes.” (23 USC § 207(m)(1)(E)).

¹⁴⁷ See footnote above.

¹⁴⁸ Hanzlik, M. and Schweninger, E., [The State of Transportation and Health Equity](#), Smart Growth America, December 2019.

¹⁴⁹ Federal Transit Administration (FTA), [Enhanced Mobility of Seniors & Individuals with Disabilities - 5310](#)

¹⁵⁰ Ibid.

department and the non-profit People's Health Clinic to provide non-emergency medical transportation (NEMT) services.¹⁵¹

The IIJA also contains several expanded or new provisions that could benefit underserved communities. Depending on local conditions and community interest, HDOs and their neighboring communities may be able to benefit from one or more of these programs, including:

- **Surface Transportation Block Grant (STBG) Program.** For this formula funding program administered by state departments of transportation, the IIJA added eligibility for private organizations that provide a public transit benefit and added ZEV charging infrastructure as an eligible project. The program also now includes equity considerations in project siting.
- **Congestion Mitigation and Air Quality (CMAQ) Improvement Program.** The IIJA amends this existing formula funding program, which applies to areas that have not met the National Ambient Air Quality standards established under the Clean Air Act, to include shared micro-mobility (such as bikes and scooters) as eligible projects, in addition to the existing car sharing provision. It also alters the program to allow retrofitting of diesel engines as well as introducing new refueling infrastructure and prioritizes the reduction of fine particulate matter (which poses high health risks¹⁵²) for disadvantaged communities.
- **Safe Streets and Roads for All Grant Program.** This new program includes competitive grants for local programs to reduce death and serious injury for drivers, bikers, and pedestrians alike, in pursuit of "Vision Zero" — zero roadway deaths.
- **Strengthening Mobility and Revolutionizing Transportation (SMART) Grants Program.** This new competitive grant program provides grants to eligible entities to conduct demonstration projects on smart city/community technology to improve efficiency and safety.
- **State of Good Repair Grants.** The IIJA continues this grant program, which has both formula and grant components designed to fund maintenance, replacement, and rehabilitation of public transit systems.¹⁵³

¹⁵¹ Federal Transit Administration (FTA), [FY21 Innovative Coordinated Access & Mobility Project Selections](#), Updated June 16, 2022.

¹⁵² American Lung Association, [Particle Pollution](#), April 17, 2023.

¹⁵³ Federal Transit Administration (FTA), [Fact Sheet: State of Good Repair and Rail Vehicle Replacement Program](#), updated December 9, 2021.

- **Grants for Buses and Bus Facilities.** The IIJA amends this competitive grant program¹⁵⁴ to include a Fleet Transition Plan requirement and funding for ZEV workforce training.
- **Resources for Technical Assistance.** Other provisions in IIJA establish resources for state, local, and tribal governments to carry out the initiatives described in other sections. These resources include the Smart Community Resource Center and the Federal Support for Local Decision-Making program, which specifically includes tools to help with increasing affordable public transit access to medical services and community resilience to extreme weather.
- **Federal Transit Administration (FTA) Programs.** The FTA provides resources for closing public transit gaps in rural areas, including Formula Grants for Rural Areas (5311)¹⁵⁵ and Tribal Transit Formula Grants 5311(c)(1)(B).¹⁵⁶ Another program the FTA offers is the Pilot Program for Transit-Oriented Development Planning - Section 20005(b) - which helps communities “integrate land use and transportation planning” to “foster multimodal connectivity and accessibility.”¹⁵⁷

Finally, an approach that was expanded under IIJA is the set of policies known as “Complete Streets”, which aim to “make the transportation network safer and more efficient” for all users.”¹⁵⁸ Complete Streets typically include public transit lanes and stops, bike lanes, accessible sidewalks, crosswalks with medians, streetscaping, and traffic-calming measures.¹⁵⁹ Twenty states and several local governments have adopted Complete Streets policies,¹⁶⁰ and some have started “measuring the performance of their transportation systems based on how well they connect people to essential services.”¹⁶¹

Community-Based Air Quality Monitoring

Actions to reduce emissions of greenhouse gasses often result in reductions in other dangerous air pollution. However, not all communities are guaranteed to realize those benefits, depending

¹⁵⁴ Federal Transit Administration (FTA), [Grants for Buses and Bus Facilities Program](#).

¹⁵⁵ Federal Transit Administration (FTA), [Formula Grants for Rural Areas – 5311](#).

¹⁵⁶ Federal Transit Administration (FTA), [Tribal Transit Formula Grants – 5311\(c\)\(1\)\(B\)](#).

¹⁵⁷ Federal Transit Administration (FTA), [Pilot Program for Transit-Oriented Development Planning - Section 20005\(b\)](#); Rural Health Information Hub (RHIhub), [Public Transportation](#), June 4, 2019.

¹⁵⁸ U.S. Department of Transportation (DOT), [Complete Streets](#), August 24, 2015.

¹⁵⁹ U.S. Department of Transportation (DOT), [Complete Streets](#), August 24, 2015.

¹⁶⁰ Complete Streets, [Complete Streets Policy Adoption](#), June 16, 2023.

¹⁶¹ Schweninger, Emily et al., [Transportation: A Community Driver of Health](#), American Public Health Association, Spring 2021.

on how the policy is designed and implemented. This is why it is important to measure whether policies are improving air quality at the community and neighborhood levels. The availability of new ways to monitor air pollution with air sensors at fixed locations and mobile monitors on instrumented-vehicles creates an opportunity for Community-Based Air Quality Monitoring to help identify the neighborhoods and communities that are exposed to higher levels of air pollution, including emissions from transportation. In the past, investments in energy and transportation infrastructure have better served privileged communities including those with a larger number of white and wealthy residents, leaving other communities underserved or harmed by those investments, and overburdened by air pollution from highways, truck routes, and other high polluting sources. Identifying air pollution hotspots is one way to inform where future investments are needed to help correct the wrongs of the past. This can help to raise awareness of health risks and provide a quantitative basis to engage in the development policies that would hold polluters accountable and reduce the harm that they cause to nearby communities.¹⁶²

The IRA provides Funding to Address Air Pollution, specifically \$117.5 million in grants for air monitoring, including air monitoring conducted by impacted communities themselves. The Environmental and Climate Justice Block Grants also provide \$2.8 billion (plus \$200 million in technical assistance), some of which can be used for community-led pollution monitoring, prevention, and remediation. So far, 132 air monitoring projects in 37 states have received \$53.4 million from the IRA and American Rescue Plan to enhance air quality monitoring in communities across the United States.¹⁶³

Seven health departments and community-based public health organizations are working with residents to conduct local air quality monitoring funded by the federal government through the American Rescue Plan (ARP) Enhanced Air Quality Monitoring Competitive Grant and educating residents about the health impacts they can expect to experience. One such organization is an HDO, the Children's Hospital of Wisconsin, which is working to "create a community-based network of neighborhood-level air quality monitoring stations in Milwaukee" with a focus on areas with high rates of asthma.¹⁶⁴ The hospital has received a \$500,000 grant to launch its Love My Air program in fall 2023. The program, which is conducted with multiple community, non-

¹⁶² For an overview of the rationale for and benefits of community-based air quality monitoring, see Bradbury, J. and Cross, E., [Issue Brief: How Community-Based Air Quality Monitoring Can Make Climate Policy More Equitable](#), Georgetown Climate Center, June 1, 2023. The issue brief also cites a number of programs and funding sources that can be used by community-based organizations.

¹⁶³ United States Environmental Protection Agency (EPA), [Biden-Harris Administration Announces \\$53 Million for 132 Community Air Pollution Monitoring Projects Across the Nation](#), November 3, 2022.

¹⁶⁴ United States Environmental Protection Agency (EPA), [Selections for the ARP Enhanced Air Quality Monitoring Competitive Grant](#), December 14, 2022; Children's Health Alliance of Wisconsin, [Air Quality](#).

profit, government, and academic partners, will install air quality sensors at select schools in the Milwaukee Public Schools district. The hospital notes:

*We will engage schools in air quality monitoring activities through involvement in air quality campaigns (like anti-idling), student engagement and leadership, school STEAM curriculum/community science monitoring using sensors, and education and awareness programs for students, families, and the community. The community will also receive education about how to access the neighborhood-level air quality data from those sensors, what the data means, and the action steps tied to that data so that residents have both the tools and knowledge necessary to respond to asthma-related air quality risk factors.*¹⁶⁵

VI. Conclusions

We find that HDOs can take a two-tiered approach to shrinking their greenhouse gas emissions and other environmental impacts from transportation; first by adopting policies and programs to reduce their own emissions and those of their employees, patients, and suppliers, and second by engaging with broader policy solutions that will complement their internal efforts at decarbonization.

New provisions of the IRA could have a significant impact on Scope 1 emissions from hospital fleets and will make it easier for hospitals and other health care delivery organizations to reduce their direct on-site emissions from fleets while lowering overall fuel costs. For employees, HDOs can implement policies for their workforce that encourage lower-emission commuting, through encouraging electric vehicles, carpooling, use of public transit, and active transportation. For patients, HDOs can support expanded and more affordable transit options and programs to encourage walking and biking. They can also take advantage of evolving insurance regulations and state laws to provide telehealth to patients where appropriate.

It is also critical for HDOs to engage in the process of designing and implementing broader policies that have an economy-wide impact on emissions from transportation. For example, low-carbon vehicle policies, such as incentives in the IRA and EPA emissions standards for cars and trucks, will create broad incentives and mandates throughout the economy to shift to electric vehicles. These policies will increase the availability and reduce the cost of low-emission vehicles that meet the needs of the health care industry. As more new cars and trucks are electric (and as more electricity is generated by wind, solar, and other zero-carbon sources), vehicles used by hospital fleets, employees, patients, and visitors will get cleaner as a matter of course. In addition, as medium- and heavy-duty trucks become cleaner, it will help decarbonize the health care sector

¹⁶⁵ Children's Health Alliance of Wisconsin, [Air Quality](#).

supply chain because a significant portion of the sector's indirect emissions come from freight transportation of hospital supplies, food, and other products.

Finally, HDOs are often important stakeholders in their communities and can take on a leadership role in communicating the benefits of sustainable and accessible low-emission transportation to state and local governments as authorities plan for new transportation infrastructure projects. In addition, engagement in new federal programs such as the Neighborhood Access and Equity Grant Program and the Safe Streets and Roads for All Grant Program may provide opportunities for new and beneficial initiatives in neighborhoods and communities where their patients and employees live.

