PORT OF DETROIT DECARBONIZATION AND AIR QUALITY IMPROVEMENT PLAN

EXECUTIVE SUMMARY

ACKNOWLEDGEMENTS

The Detroit/Wayne County Port Authority (the Port Authority) thanks the State of Michigan, and Senator Stephanie Chang, for providing the funding for the development The Port of Detroit Decarbonization and Air Quality Improvement Plan and challenging the Port Authority to take bold action to reduce carbon emissions within the port region. With this funding, the Port Authority was able to engage **Tunley Environmental** to provide expert technical consulting services to develop the baseline carbon calculations, conduct the scientific research into the proposed solutions, and in lead the engagement with Port of Detroit terminal participants. Thank you, Tunley, for your work on this important project and we look forward to continued collaboration.

We also engaged our valued community engagement partner, **Southwest Detroit Environmental Vision** (SDEV), who helped connect the Port Authority with people and communities directly impacted by port activity and ensuring their participation in this plan's development and implementation. Through this partnership with SDEV, the Port Authority gained valuable community feedback from The **Original United Citizens of Southwest Detroit** (OUCSD). Both SDEV and OUCSD have been fighting for improved air quality and the health of residents in Detroit and neighboring communities of the Port of Detroit for decades.

Importantly, we thank each of the terminal operators, port businesses, and governmental entities who participated by voluntarily sharing their emissions data, provided guidance on operations, and recommended practical solutions that could form the basis of an action plan. We could not have performed this study without your engaged involvement. We also look forward to continued collaboration as we decarbonize the Port of Detroit together.

Lastly, we thank the support of the Board of Directors of the **Detroit/Wayne County Port Authority**, who approved our vision and the contracts necessary to carry out this work.

EXECUTIVE SUMMARY

The Detroit/Wayne County Port Authority takes seriously its responsibility to limit climate change from carbon emissions and to improve air quality and the overall health of residents, workers and visitors to the 1,000+ acres of cargo terminals area along the Detroit and Rouge rivers known as the Port of Detroit. This report is the first step in fulfilling that responsibility to reduce the **impact of maritime activity** on our environment – **currently at 3% of global emissions** and increasing. Through a year-long effort of engagement with terminal operators, tugboat companies, and other essential port support operators, we have developed a reliable estimate of the greenhouse gases emanating as a result of port operations. We have also engaged with those who live, work and travel through the port to hear the **call to action for cleaner air, reduced sound, vibrations, and the danger in neighborhood streets caused by trucks that haul cargo from the port every day.** Finally, we have studied what other ports have done on their journey toward reducing emissions and improving health and safety and have collected best practices to perform the baseline carbon assessment for the Port of Detroit.

This report is not an end, but a beginning in the Port of Detroit's long road to becoming a sustainable port (known as **#GreenPortDetroit**) and reducing carbon emissions to net zero by the year 2040. In doing so, we hope to develop a port that is economically viable, while not sacrificing the health of the planet and its people.

Read the full report to learn more about the history of the port region and the peoples who thrived along the banks of this rich area. You will see how this vital waterway and the

proximity of raw materials was the foundation for Detroit to become the greatest industrial city of the early 20th century and the automobile capital of the world, producing wealth and high wages for working people. That progress, however, came at a cost – in the form of damage to our natural resources, negative health impacts for our workers and residents, and building an upward trajectory of carbon emissions from our industrialization, a challenge we are now facing on a global basis.

Below is a brief summary of our findings and the preliminary plan for achieving net-zero by the year 2040. It will take all of us to get there. Please join in.

BASELINE CARBON FOOTPRINT

The total carbon emissions have been quantified at each terminal within the Port of Detroit, either using primary data provided directly from the organization or estimated based on publicly available data. These emissions are the result of the movement of cargo on ships traveling in and out of the active industrial terminals within the port (28 miles along the Detroit River). Also included are the emissions data from additional entities, including cruise ships, local passenger vessels, governmental entities, tugboats, and other essential operators that ensure the port functions smoothly and safely. Additionally, any movement of goods on-site with heavy equipment is included in the scope of work, along with emissions within 15 miles of the Port of Detroit due to trucks and rail used in the transportation of these products off-site (drayage).

The overall emissions for the Port of Detroit region were found to be **30,296 metric tons of carbon dioxide equivalent.** Drayage from port activity accounts for the majority of carbon emissions, making up 51% of the baseline. Fuel burned during ship movement and loading/unloading represents 28% of overall emissions. Goods handling equipment accounts for 14%, yet has a high potential for reduction as the terminal operators own this equipment, whereas large vessels and trucks are primarily third party owned and operated. The graphic below (Figure 1) details the breakdown of the overall Port of Detroit carbon emissions. Terminals vary in the size and type of activity within the Port of Detroit. Therefore, each individual terminal's carbon emissions will vary based on the type of equipment used, the size of an operation, and the type of fuel used.

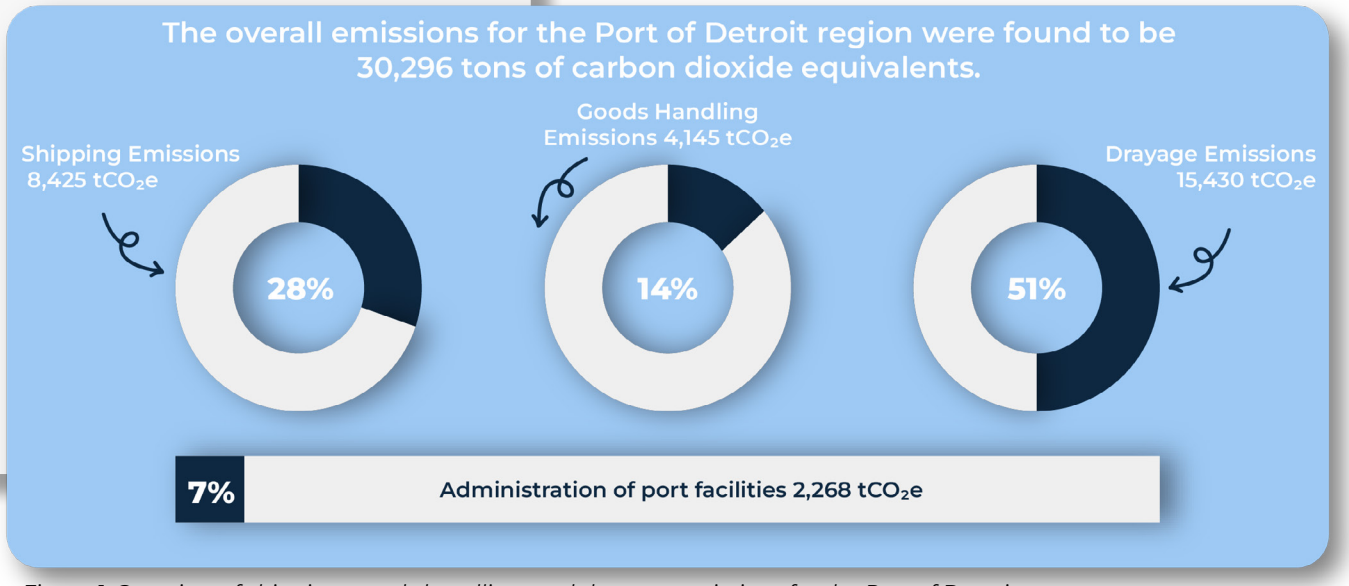

Figure 1: Overview of shipping, goods handling, and drayage emissions for the Port of Detroit.

To get a better understanding of the distribution of emissions from these terminals, the table below shows the breakdown of that carbon footprint for each organization with port activity on the Detroit River or River Rouge. Each terminal has received a personalized plan to reduce their port related emissions, with additional recommendations to improve overall air quality.

Firstly, the cruise ships visiting the Port of Detroit fall under the Port Authority's emissions. Other small vessels such as tugboats and the harbor master operate along the river, primarily powered by diesel fuels. Electrification may be suitable for some of the smaller vessels; however, biodiesel could be implemented both faster, and at scale.

For the cargo handling businesses, drayage is the primary source of emissions, despite our methodology using 28 miles for shipping and 15 miles for trucking. This is because shipping is a very efficient means of transporting goods, with around 90% fewer emissions than trucking (per ton-mile). Combined with the further impacts of trucking on the community, any transfer of truck activity to the water will have a hugely positive impact. Emissions for each operator is a function of the quantity of goods handled, efficiency of the operation, and the fuel source. **Electrification for goods handling equipment can help drive down emissions and improve air quality.** Electric equipment has lower operating costs (and lifecycle costs, after slightly higher capital expenditure). **Biodiesel,** once again, can be used in most diesel goods handling equipment, and again, **has the benefits of scale and impact.**

Moving petroleum products is an efficient process with regards carbon intensity, largely carried out using electric pumps. Our scope excludes 'industrial emissions' such as steelmaking, because the focus of the project is on port activities (the movement of goods).

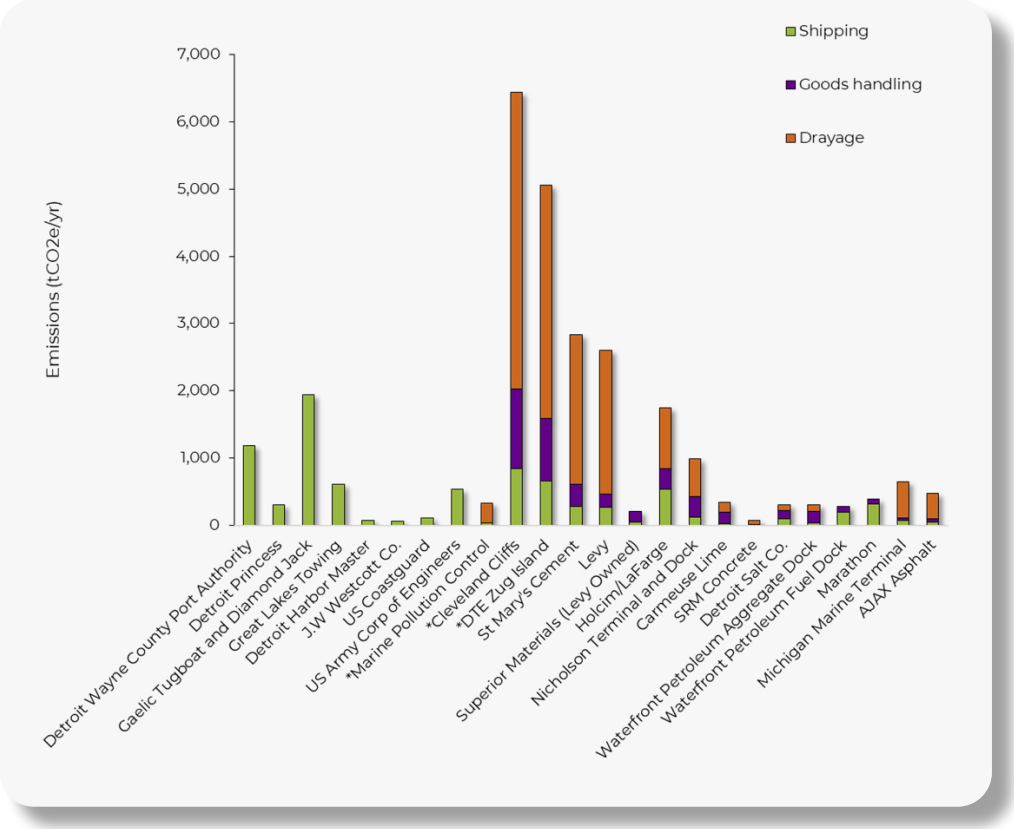

Figure 2: Bar graph of emissions by both scope and terminal.

Terminal Name	Industry Type	Shipping (tCO_2e/yr)	Goods Handling (tCO_2e/yr)	Drayage (tCO_2e/yr)	Total Emissions tCO_2e/yr)
AJAX Asphalt	Liquid Asphalt Terminal	49	46	383	**477**
Carmeuse Lime	Limestone	22	173	153	**348**
Cleveland Cliffs	Steelmaking	845	1,187	4,406	**6,438**
Detroit Harbor Master	Police Boats	76	0	0	**76**
Detroit Princess	Dinner Cruise Boat	306	0	0	**306**
Detroit Salt Co.	Salt Export	99	120	83	**303**
Detroit/Wayne County Port Authority	Port Authority & Cruise Ships	1,182	0	0	**1,182**
DTE Zug Island	Coke Production for Steelmaking	665	926	3,464	**5,055**
Gaelic Tugboat and Diamond Jack	Tugboat Company and Tour Cruises	1,943	0	0	**1,943**
Great Lakes Towing	Tugboat Company	607	0	0	**607**
Holcim/LaFarage	Cement	538	310	899	**1,747**
J.W. Westcott Co.	Mail Delivery & Patrol	60	0	0	**60**
Levy	Cement/Aggregates	274	191	2,140	**2,604**
Marathon Oil Co.	Oil Terminal	314	81	0	**395**
Marine Pollution Control	Spill Cleanup	38	0	288	**326**
Michigan Marine Terminal	Oil and gas Terminal	68	44	539	**652**
Nicholson Terminal and Dock	General Cargo Dock	124	306	684	**1,114**
SRM Concrete	Cement	7	8	58	**73**
St Mary's Cement	Cement	276	338	2,219	**2,833**
Superior Materials (Levy Owned)	Cement	53	161	0	**214**
US Army Corp of Engineers	River Dredging	534	0	0	**534**
US Coastguard	Coastguard	112	0	0	**112**
Waterfront Petroleum Aggregate Dock	Aggregate Storage	40	167	115	**322**
Waterfront Petroleum Fuel Dock	Refuelling Station and Oil Storage	193	86	0	**279**

Table 1: Table of terminal operators and baseline emissions. Terminals in gray (Marine Pollution Control, Cleveland Cliffs, and DTE Zug Island) have not supplied data, and therefore have their emissions estimated using publicly available data.

PATHWAY TO NET-ZERO

Clearly, replacing diesel and shipping fuels, which account for over 95% of port emissions, with a carbon free alternative fuel being the biggest challenge. Based on the review of available technology relative cost and supply of those alternatives, we have set ambitious targets, far beyond business as usual, to encourage innovation, gain managerial support and galvanize carbon reduction efforts in the port region. Our aim is not just to reach net zero by 2040, but to highlight action that can take place immediately to lower emissions. **Biodiesel** is available today and, using the highest possible blends, **has 74% lower emissions than traditional diesel**, and is compatible with most of the equipment used in the terminals today. Other fuels – for example hydrogen – are classed as zero emissions but are not readily available and require very expensive engine replacements. Below (Figure 3) is a summary of the action steps recommended in this plan. Offsetting will need to play a role in removing residual emissions (such as transmission and distribution of electricity) and reach true net zero by 2040.

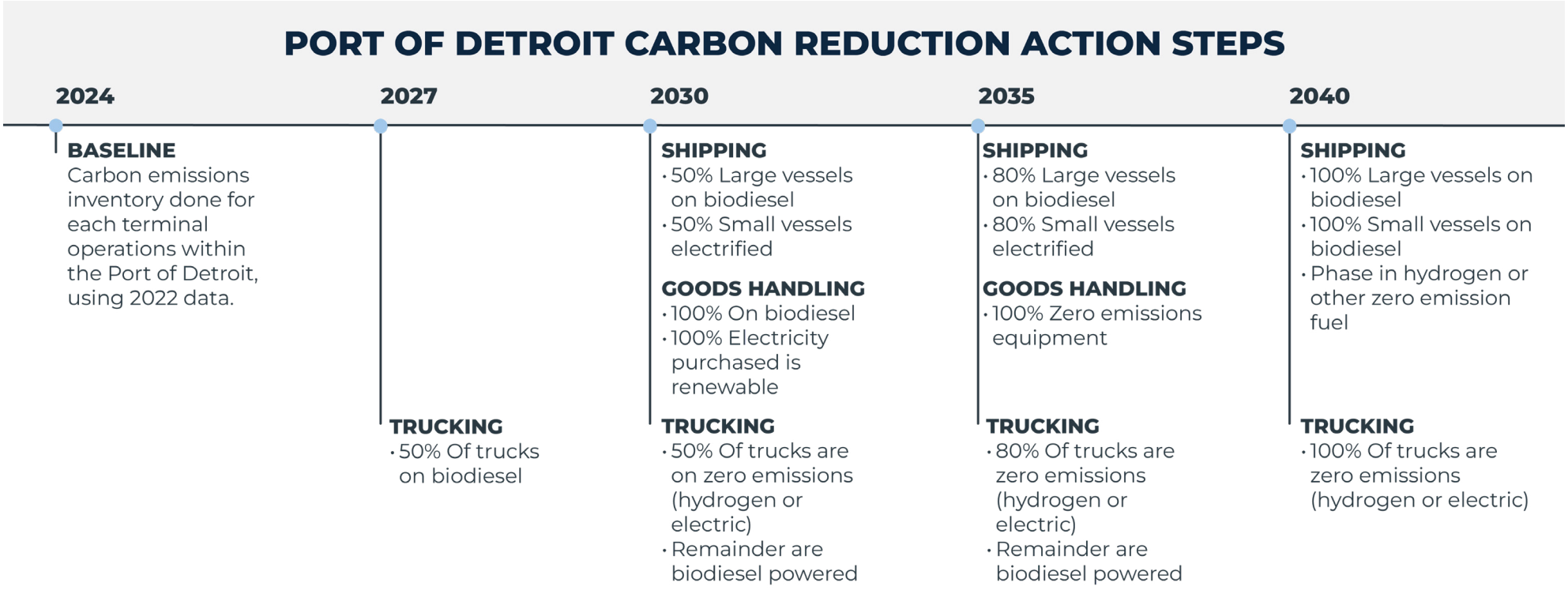

Figure 3: Net Zero roadmap for the Port of Detroit.

INTERACTIVE CARBON FOOTPRINT MAP

A key deliverable for transparency and public accountability are interactive maps that show the current and ongoing carbon footprint, readily available on the Port of Detroit's website for the public to view. Previously, terminals making up the Port of Detroit have not been easily identifiable, in one centralized location.

This interactive map (Figure 4) changes that completely, not only identifying operators, but also their baseline carbon footprint. This data transparency from private businesses puts Detroit in a strong position for further grant funding and showcases the commitment in the region towards decarbonization. This map will be updated annually to show fluctuations, as well as measures taken to reduce emissions. Just because emissions rise does not necessarily indicate poorer performance. Perhaps a terminal is receiving an increase in cargo compared to a previous year, for example. Each terminal will have notes to indicate this kind of activity.

TERMINALS

1. AJAX Paving Company
2. Cleveland Cliffs
3. Carmeuse Lime
4. Detroit Harbor Master/Sheriff Department
5. Detroit Princess
6. Detroit Salt
7. Detroit/Wayne County Port Authority
8. DTE Zug Island Operations
9. Gaelic Tugboat and Diamond Jack's Rivertours
10. Great Lakes Towing
11. Holcim
12. SRM Cncrete
13. J.W Westcott
14. Levy
15. Superior Materials
16. Marathon Oil Company
17. Marine Pollution Control
18. Michigan Marine Terminal
19. Nicholson Terminal and Dock (Ecorse)
20. Nicholson Terminal and Dock (Jefferson)
21. St Mary's Cement
22. US Army Corp of Engineers
23. US Coastguard
24. Waterfront Petroleum (Fuel Facility)
25. Waterfront Petroleum (Aggregate Facility)

CLICK HERE TO VIEW THE INTERACTIVE MAP

REDUCING OTHER HARMFUL EMISSIONS

Decarbonization has a positive impact on air quality, due to the link between the combustion of fossil fuels, and emissions associated with poor air quality (particulate matter for example).

This plan aims to elevate the performance of Port of Detroit Terminals regarding other harmful emissions – fugitive dust, sound, vibrations, and the impact of truck traffic in our communities. That is why we are encouraging all port terminals to join the internationally recognized Green Marine certification program. **Green Marine sets achievable standards for environmental excellence in maritime** operations and is specific to the industry of the entity signing up. Terminal operators, ship owners and port authorities can join and agree to pursue annual improvements in operations to achieve those standards. For example, terminal operators will commit to reducing noise, idling of vehicles, and containing dust, among other things.

Our goal is to have all participants in the Port of Detroit achieve Green Marine certification by 2030 and maintain that level for years to come. For more information on the standards, **visit Green Marine**.

COMMUNITY ENGAGEMENT

Our work on this plan could miss the mark if not informed by the lived experience of community members, who have experienced the impacts of port and industrial activity for many decades. Through **community meetings, engagement with community organizations and leaders, and governmental officials**, this plan has been created with this lived experience in mind. The Port has many positive impacts on the community, including well-paid employment and providing a significant contribution to the local economy. Of course, jobs and income are vital and most agree that our economy needs a thriving port to provide raw materials for our factories, construction, roads and fuel for our homes and businesses. However, the well documented public health impacts need to be addressed. It is also the case that the impacts of port activity disproportionately are greater on people of color and those with lower incomes.

Our plan and the action steps will incorporate environmental justice and continue meaningful engagement, ensuring that the communities in and near the port will have input into the decisions regarding port development and decarbonization. The **#GreenPortDetroit** that we are creating must benefit the entire community.

ENGAGING WITH GOVERNMENT OFFICIALS

COMMUNITY MEETINGS & ENGAGEMENT

WORKING WITH TERMINAL OPERATORS

COLLABORATIONS

This project would not have been so impactful, it not for the voluntary commitments of the terminal operators and other port participants who came forward to share information on their operations and worked toward the development of the targeted solutions presented here. The Port Authority has no statutory power to compel the sharing of this information. Yet, many of the terminal operators have come together to create the **Low Carbon Port Committee** and have agreed to carry on the work through quarterly meetings over the next 16 years of implementation of the plan. The Committee will meet to discuss best practices, **Green Marine participation**, and collaborate on grant submissions. The Port Authority will convene and document those meetings and encourage robust efforts to achieve the plan's goals.

In addition to the terminals' collaboration, continued collaboration with community groups such as **SDEV** and **OUCSD** will be fundamental in shaping the next 16 years. The Port Authority will establish an advisory board that will meet at least annually to evaluate the progress of the plan implementation and help set the course for future projects and standards development. The Decarbonization and Air Quality Improvement Advisory Board will be comprised of community leaders, residents, governmental officials, and port businesses. The Port Authority will also convene and document these meetings and support the efforts and goals of this advisory board.

COLLABORATING WITH COMMUNITIES

THE LOW CARBON PORT COMMITTEE

WORKING TO IMPROVE AIR QUALITY

CALL TO ACTION

The urgency of climate change is clear. It is impacting our water levels, causing dramatic weather pattern shifts and is affecting our ability to grow food. The goal of limiting the rise in global temperatures to no more than 1.5 degrees Celsius is in jeopardy if we do not change course and begin reducing our usage of carbon emitting fossil fuels like oil, natural gas and diesel immediately. There are technologies to make this happen and resources are now flowing from the federal government to make these changes rapidly and in a sustained way. **All that's needed is the collective will and energy to change.**

This plan is a call to action for all of those who live, work, and are active in the area known as the Port of Detroit. Each of us can get involved by advocating for and demanding that our businesses, governments, organizations, and individuals take action now. This plan is an opportunity to rebuild the Port of Detroit in a way that respects nature, that values human life and the health of all our people.

JOIN IN THE EFFORT.
WE CANNOT DO IT WITHOUT YOU.

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