



REPORTER

AMERICAN PUBLIC WORKS ASSOCIATION / May 2019 / www.apwa.net

2019
TOP TEN
PUBLIC WORKS
LEADERS OF
THE YEAR
(page 30)



PUBLIC WORKS IT STARTS HERE

NATIONAL PUBLIC WORKS WEEK
MAY 19-25, 2019

INSIDE:

- Annual Sustainability Issue
- See how the Town of Williston celebrates National Public Works Week (page 22)
- North American Snow Conference (pages 16-19)



Incorporating climate change goals and emissions tracking into your CIP

Matt Rodrigues, P.E., ENV SP, City Engineer, Public Works Engineering, City of Eugene, Oregon, and Chair, APWA Center for Sustainability

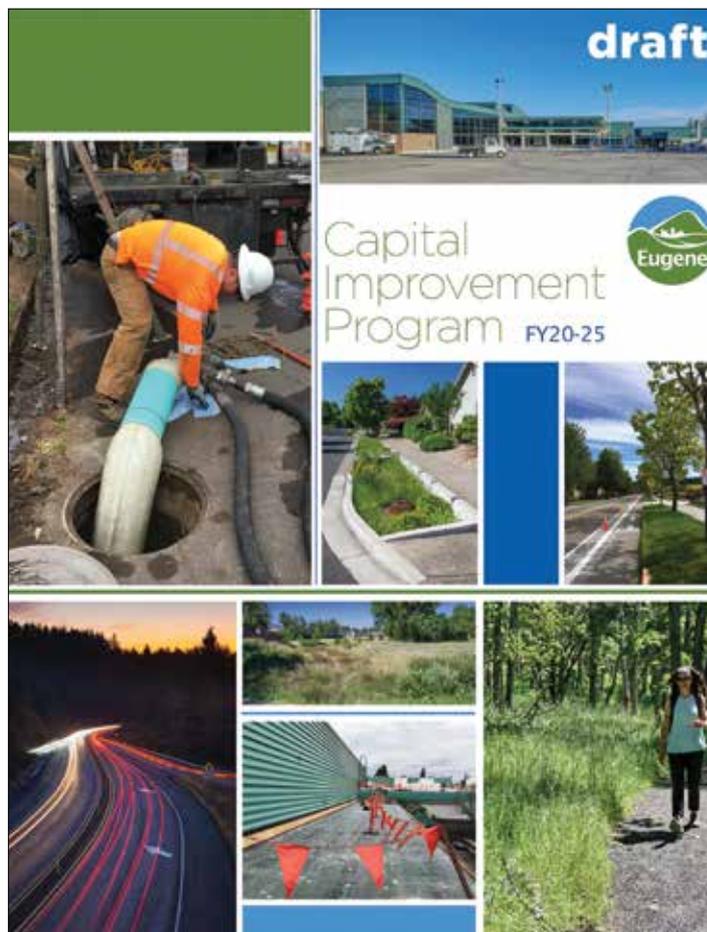
As communities grapple with the effects of climate change, local governments have emerged as leaders in establishing sustainable practices that reduce greenhouse gas (GHG) emissions and implement adoption strategies to build community resilience.

In 2017 the City of Eugene, Oregon Budget Committee, comprised of City Council members and community volunteers, directed staff to move forward with the following changes to our Capital Improvement Program (CIP):

1. Create GHG estimates and reduction metrics for CIP projects;
2. Track projects that help meet our Climate Recovery Ordinance goals; and
3. Prioritize projects that help us meet our Climate Recovery Ordinance Goals.

This direction was the next step in moving the City forward to meet its aggressive Climate Recovery Ordinance goals to reduce community fossil fuel consumption 50% by 2030, reduce community GHGs by 7.6% annually, and establish carbon-neutral City facilities by 2020.

The City has a long history of implementing sustainable practices that reduce GHGs as part of capital projects. However, incorporating GHG estimates for construction and operations of building and infrastructure projects and identifying and prioritizing projects that align with the City's Climate Recovery Ordinance as part of the CIP development process represented a significant challenge.





Development Process

The City's CIP forecasts capital project needs over a six-year period and is updated every two years. While adoption of the next update to the CIP was not scheduled until March 2019, the process to develop it would begin in early 2018 leaving little time to assemble a strategy and process for incorporation of the new requirements.

Finance staff responsible for coordinating the CIP process set to work establishing an advisory group consisting of budget and capital program area leadership and staff skilled in GHG calculations and experienced with internal climate action planning efforts.

The advisory group identified the process and tools that would be used to calculate greenhouse gas emissions and set the framework for identifying and selecting projects that would help meet Climate Recovery Ordinance goals.

After the general framework was complete a CIP development coordination meeting was held with staff leads responsible for each capital program area: Airport, Facilities, Parks and Open Space, Stormwater, Transportation and Wastewater. At the training an overview of the prioritization framework was presented and examples of GHG calculations were reviewed. While facility projects had long integrated energy efficiency modeling calculating energy use, which could easily be converted to equivalent GHG emissions, estimating emissions from building and infrastructure construction materials was a relatively new concept for most staff.

A spreadsheet-based tool created by local Eugene sustainability consulting firm Good Company was used for calculating construction-related emissions. The tool was designed to include emissions factors for common infrastructure and

GHG emissions per a dollar of estimated project cost were calculated using historic unit costs and material quantities from similar past projects.

building construction materials including a menu of options for concrete, asphalt, steel, wood, electrical equipment and plastics as well as construction equipment fuel usage.

While staff generally expressed enthusiasm for the intention of the work, there was concern about the complexity of calculations and the amount of work required to produce GHG estimates. In addition, some projects and program areas were challenging to estimate as the scope of the projects was not detailed enough to identify specific design choices that would influence GHG emissions from construction and operations.

To support staff developing each capital program area a technical liaison was assigned to assist with GHG calculations and provide consistency. To account for the high-level scope of projects and programs in the CIP, estimates of GHG emissions per a dollar of project cost were developed for common project types such as pavement rehabilitation and reconstruction, shared-use paths, water quality facilities, stormwater and wastewater pipe repairs and parks projects. These GHG emissions per a dollar of estimated project cost were calculated using historic unit costs and material quantities from similar past projects.

Projects were then mapped to applicable plans and policies including those that were expected to contribute to meeting Climate Recovery Ordinance goals and prioritized. Where feasible GHG estimates for construction and operations were calculated and tracked by project and program area. Additionally, narratives were developed for each capital program area providing an overview of the program and highlighting the current efforts and future opportunities to reduce emissions.

The Draft CIP was presented to the Budget Committee in February 2019 and adopted by City Council in March 2019. Budget Committee and City Council members were very supportive of staff's work to formally incorporate Climate Recovery Ordinance goals and greenhouse gas estimates into the CIP and encouraged continued further refinement of processes and development of decision-making tools to help reach our Climate Recovery Ordinance goals.

Lessons Learned

Pay attention to greenhouse gas-intensive construction materials. The voters of Eugene have generously passed three five-year street paving bonds with the latest passing in 2017 and funding construction projects in 2018 through 2023. These street paving bonds have helped the City reduce our street maintenance backlog by over \$200 million. In addition, these investments drastically reduce the number of streets requiring reconstruction by rehabilitating the pavement before complete failure occurs reducing costs and GHGs from materials. Additionally, the street paving projects provide opportunities for implementation of Vision Zero transportation safety and complete streets improvements.

However, due to the GHG intensiveness of asphalt and concrete, street paving was responsible for the majority of GHGs in the CIP. To help mitigate paving GHGs, Eugene has established standards for reduction of emissions through use of the warm-mix asphalt process and high recycled content ($\geq 30\%$) in asphalt and use of substitute cementitious materials, such as slag cement and fly ash, in place of Portland Cement in concrete.

GHGs from construction are typically smaller than GHGs from long-term operations. It is common knowledge that GHGs to construct buildings are typically dwarfed by operational emissions from electricity and natural gas usage over the life of a facility. Similarly, GHG investments to maintain streets and paths and build new active transportation infrastructure are likely very small compared to the emissions for the transportation sector as a whole in your community. Eugene's annual average GHGs from transportation infrastructure construction were approximately 1,800 metric tons of carbon dioxide (does not include emissions from state highway infrastructure) while in 2017 community transportation sector GHGs (vehicle fuel use) were estimated at over 532,000 metric tons of carbon dioxide.

Develop more consistent and transparent metrics for project selection. While each of Eugene's capital program areas have a framework for decision making and prioritizing projects in the CIP, more work is needed to develop consistency across program areas and provide for improved transparency.

We developed a shared understanding of how our project and material choices influence progress toward our climate recovery goals.

Tracking, analysis and decision-making tools will continue to evolve. Currently, tools allow for estimation of GHGs from common construction materials and energy and fuel use. More complicated tools, such as the Oregon Department of Transportation's VisionEval Model, can analyze the impact of transportation outcomes, such as tripling the number of trips by bike. However, even complicated models are not yet able to estimate how projects individually or as a whole influence community transportation choices to reach this goal.

Over time, greenhouse gas analysis and estimating tools will continue to evolve, giving agencies more certainty as to how projects and programs affect outcomes and the choices people make each day.

In conclusion

The process to incorporate climate recovery goals and GHG tracking in Eugene's CIP required a significant investment in process development, training and staff time. While achievable, it was a challenge for staff, who like most agencies, are tasked with meeting numerous competing community priorities with limited resources.

In addition to delivering a CIP that meets City Council, Budget Committee and community expectations, the most beneficial outcomes of the process were greatly expanding organizational knowledge of tools and methods for estimating greenhouse gas emissions for CIP projects and developing a shared understanding of how our project and material choices influence progress toward our climate recovery goals.

Matt Rodrigues can be reached at (541) 682-5243 or MRodrigues@eugene-or.gov. 