

## Waste, Consumption and Natural Resources (WCNR) Subcommittee

### Executive Summary

In order to comprehensively address Los Alamos County's GHG emissions, as well as plan for resiliency and sustainability in the face of climate change, it is necessary to consider broadly the activities and resources of the community. To that end, the Scope of Work identified for WCNR is:

- ***Address reduction of greenhouse gases generated by activities other than municipal natural gas use, electrical generation, transportation and buildings***
- ***Make recommendations regarding resiliency and sustainability actions within the areas chosen***



Focus areas identified so far include:

- Waste management, recycling, and composting
- Consumption of goods, food and services
- Refrigerants and other fluorinated gases
- Emissions from construction
- Management of natural spaces, soil, land use, deforestation/reforestation, agriculture, carbon sinks
- Water and wastewater

Potential recommendations for each focus area are listed in this report and are diverse. Most provide not only GHG reductions, but also enhancement of LAC resiliency and sustainability, economic benefits, and improvements to health, equity, environment and quality of life.

### List of recommendations

1. Perform consumption-based GHG analysis for LAC

#### *Waste Management, Recycling and Composting*

2. Following "Zero Waste" principles, eliminate municipal waste sent to landfill through reduction, re-use, recycling and composting.

#### *Consumption of Goods, Food and Services; Refrigerants; Construction*

3. Educate community regarding sources of GHG emissions and provide information on reduction of personal carbon footprint

4. Reduce consumption-associated emissions by encouraging and supporting sustainable purchasing, use and disposal of food, goods and services

#### *Natural spaces, Land Use, Water and Wastewater*

5. Continue canyon restoration efforts around the county
6. Increase community's access to and use of open space
7. Test and record quality of water runoff and aquifer including looking for chemicals commonly used such as herbicides, pesticides, plastics from synthetic sports fields, legacy contamination etc.

### **Introduction**

In 2021, addressing climate change is urgent and complex and this necessitates considering and acting upon many different sources of GHGs and climate effects. Much emphasis has been placed on changing our electricity, heating and fuel sources, which is vital. However, a rapid, appropriate response to the challenge of climate change mitigation requires looking as broadly as possible at many causes and solutions in order to identify the most impactful, feasible and scalable actions. This must be an inclusive process to be most effective, providing opportunities for all who wish to be involved to engage in ways that work for their interests, abilities and means. We must also be prepared to deal with the effects of climate change, which is already impacting our community, our environment and our water supply, and foster a resilient Los Alamos that continues to flourish.

In order to ensure that the RES Task Force comprehensively addresses GHG reduction and climate change mitigation, the WCNR Subcommittee was formed to make recommendations on the focus areas listed above. Our approach has been to:

- Research significant sources of GHG emissions that fall outside the scope of other subcommittees, to enable more comprehensive accounting of Los Alamos' total carbon footprint
- Review approaches taken by other communities as described in their climate action plans
- Identify and understand current activities in the County that address these areas
- Propose measures to reduce these impacts which are practically and economically feasible for County government, businesses and residents
- Estimate costs and benefits of proposed GHG reduction approaches, and identify short, medium and long term actions and goals
- Make recommendations regarding resiliency and sustainability actions within the areas chosen

The research effort for each focus area has been undertaken by one or two members of WCNR, and the recommendations below reflect various stages of completion. All recommendations are subject to further modification, addition or elimination as subcommittee work continues through 2021.

## Background/Research/Data

Specific background information is provided with each recommendation, along with available data and references.

An excellent overview of diverse climate change solutions and their relative impacts can be found at Project Drawdown (<https://drawdown.org/>). A discussion of the inclusive approach to GHG and climate change mitigation taken by our subcommittee can be found in Jonathan Foley's article, ["We Need to 'See the Whole Board' to Stop Climate Change"](#)

Additional sources of information, such as climate action plans from other cities, are available on request.

## Protocol Followed (if applicable)

See Recommendation 1 for discussion of the need for appropriate GHG inventory for LAC emissions utilizing a consumption-based protocol (TBD).

## Glossary of Terms/Acronyms

CB: Consumption-Based

CO2e: carbon dioxide equivalent

GHG: greenhouse gases

HFC: hydrofluorocarbon

LAC: Los Alamos County

RES: Los Alamos Resiliency, Energy and Sustainability Task Force

WCNR: Waste, Consumption and Natural Resources Subcommittee



## Recommendation 1: Perform Consumption-Based GHG Analysis for LAC

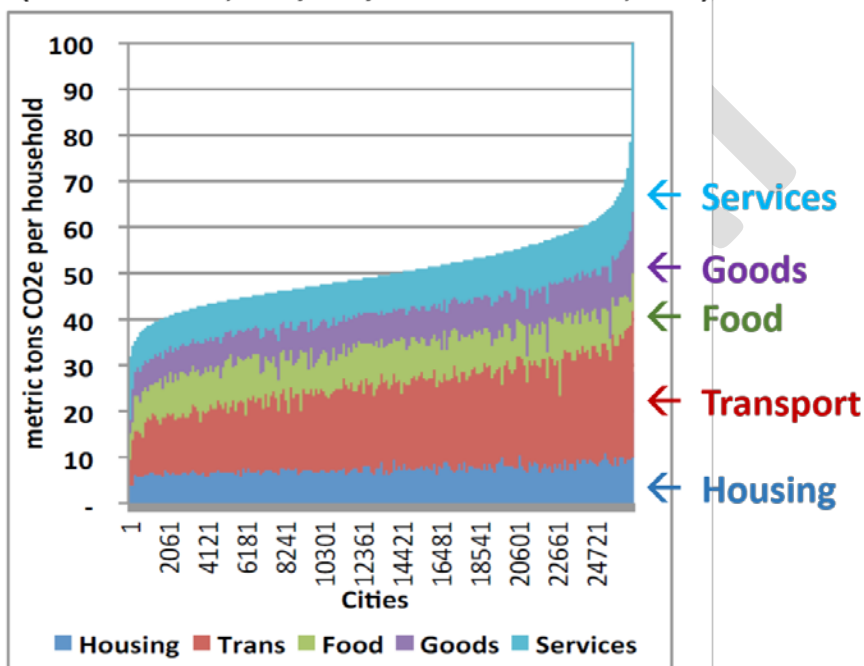
**Time Frame:** Medium Term; 2022, and ongoing

### Background/Research/Data (Baseline or other)

- Existing LAC estimates account for GHG emissions from electricity production, natural gas use, transportation fuel and solid waste (R. Gibson, 2021 report.)  
Per capita CO<sub>2</sub>e estimate = 11.9 tonnes/yr
- The total LAC community GHG footprint, which includes the above plus emissions associated with goods, food and services consumed by a community (a “consumption-based” [CB] estimate), is likely to be considerably higher (based on results from GHG inventories of middle-high income communities in N. America and Europe.)
- One CB study, performed for each zip code in the US, calculates LAC per capita GHG emissions to be 24 tonnes/capita/yr (Jones & Kammen, 2014), about **twice the current estimate**.

### Carbon footprints by category across 26,697 US cities

(Household data, analysis by Jones and Kammen, 2014)



*In addition to emissions from electricity, natural gas and vehicle fuel, households are responsible for the carbon footprint of goods, food and services they purchase. These emissions are substantial and occur in all communities.*

### Outcome

- More comprehensive understanding of total CO<sub>2</sub>e emissions resulting from the various activities of residents, businesses, county government and schools
- Identification of most timely, urgent and in some cases, easy activities to target in efforts to reduce GHG emissions
- Help insure equitable actions for GHG reduction initiatives

- Provide baseline data for goal setting and ongoing monitoring that aligns with state and national data, and allows for comparison as well as estimated benefits by sectors

## **Case Study**

See Examples in Other Communities, below.

## **Strategy**

- Evaluate existing methods used by other communities for suitability and feasibility
- Determine scope of analysis, given LAC goals
- Determine if analysis should be done by LAC Staff and/or external consultant
- Perform analysis
- Provide results to County Council, Boards and staff, and residents, together with strategies that target GHG sources identified in analysis
- Monitor changes to GHG emissions through ongoing and periodic analyses

## **Impact/Examples in Other Communities**

- King County, WA: Performed a CB GHG analysis, and found that 63% of emissions were due to goods, food, services and construction.
- Eugene, OR found that consumption-based emissions were more than 2.5 times greater than previously estimated local emissions.
- Multnomah County, OR: A CB analysis found that 53% of GHG emissions resulted from food, goods and services consumed in the county.
- Lake Oswego, OR: A CB analysis found that 46% of GHG emissions were due to production, transport and disposal of goods, food and services.
- Denver, CO: is in the process of updating its GHG inventory, setting a new baseline using CB estimates.

## **Economic Impact**

- Anticipated costs:
  - LAC Staff time to prepare RFP (if using consultant), hire and work with consultant
  - LAC Staff time to gather relevant data for analysis
    - Possible additional cost to purchase economic data and/or conduct spending surveys of community
  - Fee for analysis by consultant (if used)
  - Funds for education/outreach to community regarding results and GHG mitigation actions

- Anticipated economic benefits:
  - Provides data to inform selection of most impactful and cost-effective interventions to lower GHG emissions

### **Benefits Other than CO2 Reduction**

- More honest accounting of GHG sources adds to credibility of Task Force report and recommendations
- Potential for greater equity in actions recommended and taken to lower GHG emissions (Lower-income HHs typically have lower CB emissions, and from different sources, than more affluent HHs.)
- Opportunity to educate community on full environmental impacts of lifestyle
- Allows community and leadership to take a critical look at LAC GHGe and assess anticipated reduction by mitigation strategy (aid in prioritization of strategies)

### **Challenges & Anticipated Barriers**

- Economic/spending data for analysis may need to be gathered.
- Consumption-based measures, based on economic data, can be difficult to use for ongoing monitoring of GHG reductions.

### **Community Outreach**

- Potential for educational outreach done while collecting data on household/business/municipal government/school spending
- Educational outreach based on analysis outcome, with suggestions for actions to be taken by residents, etc. to reduce GHG emissions

### **References/Resources**

- *CBEI Guidebook*-- by the Stockholm Environment Institute provides advice for local governments seeking to measure and manage their carbon footprint using consumption-based emissions inventories (CBEIs) <https://sustainableconsumption.usdn.org/climate/cbei-guidebook/overview>
- *PAS 2070: 2013 Specification for the Assessment of Greenhouse Gas Emissions of a City (PAS 2070)* <http://shop.bsigroup.com/Browse-By-Subject/Environmental-Management-and-Sustainability/PAS-2070-2013/>
- *Under-reporting of greenhouse gas emissions in U.S. cities*. NATURE COMMUNICATIONS | (2021) 12:553 | <https://doi.org/10.1038/s41467-020-20871-0>
- Christopher M. Jones and Daniel M. Kammen, [Spatial Distribution of U.S. Household Carbon Footprints Reveals Suburbanization Undermines Greenhouse Gas Benefits of Urban Population Density](#). *Environ. Sci. Technol.*, 2013, dx.doi.org/10.1021/es4034364

### **Waste Management, Recycling and Composting**



## Introduction

Solid waste in Los Alamos is managed by the Los Alamos County Environmental Services Department (ESD). The ESD provides trash, recycling and yard trimming collection services to all residents and trash and recycling collection for commercial entities in the county. This includes 7,200 households, 333 commercial dumpsters in service and a 7 day per week transfer station operation. In 2019, residential waste collected represented 4,889 tons, commercial waste was 2,890 tons. The diverted waste (recycled, reclaimed, or composted) is approximately 21,194 tons/annually or 56% of all waste generated. In addition, the municipal solid waste, which includes all commercial, residential and transfer stations is 16,509 tons and is shipped to the Rio Rancho landfill at a cost to the county of approximately \$1,000,000 in 2019, which includes transportation and disposal. In addition, the Rio Rancho landfill is predicted to close in the next 5-7 years and the next landfill will be a further distance and may increase the cost of hauling and disposal.

The Environmental Services Department submits a monthly report on waste diversion and GHG benefits and costs of these activities in their monthly sustainability report [HERE](#). You can also read the 2017 Environmental Sustainability Plan [HERE](#).

## Recommendation 2: Following “Zero Waste” principles, eliminate municipal waste sent to landfill through reduction, re-use, recycling and composting.

For the Los Alamos County waste recommendations, the LARES Task Force is recommending a Zero Waste approach, which was adopted by the US conference of Mayors in 2015. Zero Waste is a philosophical and programmatic strategy to minimize the environmental impact of materials disposal. Ideally, all materials and products would be reduced, or re-used, re-purposed, recycled or composted. This strategy prioritizes care of hazardous materials, so that disposal or recycling of these is done to have a minimal (ideally zero) impact on the natural and human environments. Los Alamos County has the opportunity to be a leader in the work of Zero Waste through community commitment to reducing materials that end up in the waste stream, reusing or re-purposing materials, and recycling. This is an innovative, socially connected community of scientists, nature enthusiasts, educators and people dedicated to service and innovation. We are also the healthiest county in the United States. With these attributes, we are well-poised to tackle the complexities and challenges of shifting toward a future that embraces Zero Waste practices. It is estimated that 21,194 tons of material, which include concrete and asphalt, recycle, yard trimmings, batteries, electronics, tires, pallets, metal, cardboard, mixed recycle, oil and antifreeze, were diverted from the landfill in 2019. Seventeen percent of waste is food waste, of which 491 tons (37%) come from commercial enterprises and 831 tons (63%) come from residential homes.

## Time frame/SMART Goals:

1. Decrease (over time to 100%) the amount of municipal solid waste (MSW) that is deposited in a landfill
  - a. Increase diversion rate of materials to 90% of waste diverted from landfill by ? Year? (example from Los Angeles, CA: 90% by 2025, 95% by 2030 and 100% by 2050)
  - b. Reduce municipal solid waste generation per capita by 15% by 2030, including phase out of single use plastics by 2028
  - c. Eliminate organic waste going to landfill (by 2028?)
  - d. Increase proportion of waste products and recyclables productively used or repurposed by ??% in 2025 and ???% by 2035
  - e. Increase commercial and industry participation in county goals by ???% per year - to 100% by 2030

## Planning

- **Strategy – 1 Integrate concepts of Zero Waste into all aspects of LAC. This includes education, programs and practices as well as supported outreach on Zero Waste goals, strategies and benefits.**
  - Tactic 1: With resource allocation (staffing/consultants) implement policies to support reduction of single use materials and waste produced, and support repurposing and recycling where indicated.
    - Considerations
      - Responsible waste management systems (trash, compost, recycling)
      - Improve county recycling and compost operations - to increase capacity
      - Hazardous waste reduction best practices
      - Disaster planning to include waste reduction strategies
  - Tactic 2: Implement waste reduction, composting and recycling at all county facilities, programs and household services.
    - Considerations
      - Policies and codes need to be reviewed for opportunities to support Zero Waste goals.
  - Tactic 3: Conduct waste education and outreach on Zero Waste and programs, practices and recommendations for individual, commercial and county/public entities to adopt this framework.
    - Considerations:
      - Support/incentivize local commerce innovations
      - Green business awards
      - Promote Zero Waste outreach at events (support needed)
  - Tactic 4: Improve recycling practices - through 100% recycling and at the same time, decreasing reliance on single use materials.
    - Considerations
      - Use apps and programs like Recycle Coach
    - Improve recycling education to include environmental footprint, so people understand the % of materials that are actually transitioned to usable products.
    - Look for ways to reuse materials that are generated in Los Alamos county
    - Support commercial recycling through policies, codes and services that improve recycling practices.
  - Tactic 5 Improve refrigerant management policies and recycling
    - Every refrigerator and air conditioner contains chemical refrigerants that absorb and release heat to enable chilling. Hydrofluorocarbons (HFCs), the primary replacement for ozone depleting substances, spare the ozone layer, but have 1,000 to 9,000 times greater capacity to warm the atmosphere than carbon dioxide. In May 2021, the U.S. Environmental Protection Agency (EPA) proposed its first rule under the American Innovation and Manufacturing (AIM) Act of 2020 to phase down the production and consumption of HFCs.
    - Consequently, adopt policies and practices as outlined in Project Drawdown to:
      - avoid leaks from refrigerants
      - destroy refrigerants at end of life, both after the adoption of alternatives to HFC refrigerants such as propane, isobutene, ammonium, etc.



- Tactic 6 Improve household hazardous waste reduction and safe disposal
  - Household hazardous waste (HHW) includes cleaners, solvents, automotive fluids, batteries, garden chemicals, and other materials that pose hazards to solid waste workers and the public. Proper disposal is necessary to prevent injury, illness, or environmental contamination. Although HHW is excluded from Subtitle C of the Resource Conservation and Recovery Act, it is regulated under Subtitle D of this law as a solid waste. In other words, household hazardous waste is regulated on the state and local level.
  - Considerations:
    - Reduce purchases of products that contain hazardous ingredients for viable alternatives. Advance collection programs, events, and opportunities. Utilize information resources from the EPA, NMED, and NM Recycling Coalition.
    - Battery use, recycling and disposal
    - Pesticide sale, use and safe disposal
- Tactic 7 Encourage recycling and repurposing of construction materials for construction projects in Los Alamos.
  - Considerations:
    - Construction material re-purposing, for example the Habitat for Humanity Re-Store.
    - Sustainable Materials Management approaches for C&D materials should be considered. These include best practices for Reducing, Reusing, and Recycling Construction and Demolition Materials: <https://www.epa.gov/smm/best-practices-reducing-reusing-and-recycling-construction-and-demolition-materials#buytake>, Design for Disassembly [https://kingcounty.gov/~media/depts/dnpr/solid-waste/green-building/documents/Design\\_for\\_Disassembly-guide.ashx?la=en](https://kingcounty.gov/~media/depts/dnpr/solid-waste/green-building/documents/Design_for_Disassembly-guide.ashx?la=en), and NM Construction & Demolition Recycling Guide, [https://www.recyclenewmexico.com/pdf/C&D\\_Guide\\_2010\\_FINAL.pdf](https://www.recyclenewmexico.com/pdf/C&D_Guide_2010_FINAL.pdf).
    - Use asphalt and concrete in projects in Los Alamos. Sustainable materials management (SMM) is a systemic approach to using and reusing materials more productively over their entire life cycles. Technical guidance, tools, and models such as: EPA SMM Strategic Plan Examples:
      - <https://www.epa.gov/smm/epa-sustainable-materials-management-program-strategic-plan-fiscal-years-2017-2022>, Road Ahead report <https://www.epa.gov/sites/production/files/2015-09/documents/vision2.pdf>, Waste Reduction Model (WARM) <https://www.epa.gov/warm/basic-information-about-waste-reduction-model-warm> should be explored for applicability. Feasibility of materials and waste exchanges through Reuse Centers, which are markets for buying and selling reusable and recyclable commodities, should be investigated.
- Tactic 8: Increase organic waste diversion

- Goals: 0% of compostable materials will be sent to landfill
- Increase composting of yard trimmings to 100%. Currently, 70% of households have yard trimming carts.
- Implement food waste composting – community compost pick up for food waste, policies for public, county and commercial food waste reduction and composting
  - Examples:
    - Restaurants: compostable to-go containers and utensils
    - Households, apartments, schools and businesses will have compost pick up
    - More backyard composting kits
    - Partner with schools, churches, extracurricular activities and nutrition services to reduce food waste through left over challenges
    - Guerilla food app – for fruit trees and Gaia's Pantry project
- Tactic 9: Reduce reliance on single use items
  - Implement best practices that support reusable materials
  - Integrate water bottle filling stations throughout downtown
  - Conduct a community campaign to bring own cups everywhere
  - Work with grocery and food vendors to reduce impact of “to go”
- Tactic 10: Support reusing, repurposing and repair
  - Exchange center for sharing of reusable household items
  - create a re-maker space with community to fix and repair and trade
- Tactic 11: Incentivize, fund/support “Waste to Energy Solutions”
  - Considerations:
    - LA county could look into the use of anaerobic digestors for methane recovery - refinement and pipe into other processes. Organic wastes can emit fugitive methane gases as they decompose. Methane creates a greenhouse warming effect 34 times stronger than carbon dioxide over a century. One option to control decomposition of organic waste is in tanks called anaerobic digesters. They harness the power of microbes to transform scraps and sludge and produce two main products: biogas, an energy source, and solids called digestate, a nutrient-rich fertilizer. A potential source would be the closed landfill. Overall, landfills can be a top source of methane emissions, releasing 12 percent of the world's total. Landfill methane can be tapped, captured, and used as a fairly clean energy source for generating electricity or heat, rather than leaking into the air or being dispersed as waste. The climate benefit is twofold: prevent landfill emissions and displace coal, oil, or natural gas that might otherwise be used.

## References/Resources

[Los Angeles County Sustainability Plan](#)

### **Recommendation 3: Educate community regarding sources of GHG emissions and provide information on reduction of personal carbon footprint**

**Time Frame:** Ongoing

#### **Background/Research/Data (Baseline or other)**

Community GHG emissions arise from diverse activities of residents, businesses and other entities. Rapid reduction of emissions requires addressing as many of these important sources as possible, by as many people as possible. Many people would like to take action to reduce personal emissions, but general understanding of these sources, and how to reduce them, is often limited. Also, individuals and entities have different desires and capabilities to reduce their “carbon footprint” and should have choices in how to do so.

#### **Outcome**

- Extensive public education campaign results in greater community understanding of important sources of GHG, where they arise in daily life, and the options available to reduce them.
- Resources are readily available for residents and other entities to use to estimate personal GHG emissions and learn ways to address them.
- Material and social incentives are provided to help engage the community in learning about and acting on GHG reduction options.
- Opportunities are provided and supported for **all** residents and entities to participate in climate change actions of their choosing, suited to their interests, means and resources.

#### **Case Study/Public Education**

Annually since 2017, LAC Environmental Services and the Environmental Sustainability Board (ESB) have conducted a community-wide “EcoChallenge.” This fun, interactive program utilizes an on-line platform to engage residents in learning about ways to reduce their environmental impact. Dozens of teams have participated, including many school groups, and hundreds of residents have taken action to learn about and reduce their carbon footprint, energy, water and fuel use, and other sustainability measures.



#### **Strategy**

- Research and evaluate existing carbon footprint calculators and accompanying information on GHG reduction actions
- Develop/aggregate online resources for use by the community to explore GHG footprints and actions to take to mitigate. Publicize widely as a “One-Stop Shop for Reducing your Carbon Footprint” (perhaps as part of larger “Sustainable Living” web resource)
- Develop/Implement “Los Alamos Carbon Free Challenge” and other campaigns to engage community in reducing GHG emissions. These campaigns will include education, social engagement, and competitions, and target youth, adults, businesses, and local government employees.

## Impact/Examples in Other Communities

- Eugene, OR implemented a “Carbon Free Challenge” which engaged city residents in online and in-person carbon reduction activities and competitions.
- The Oregon Department of Environmental Quality provides a Carbon Footprint Calculator on its website, together with “Take Action” options and pledges for its residents.

## Economic Impact

- Costs: Funding for educational outreach to community including staff time, advertising, purchase of incentives (\$1-5 per resident)
- Savings: To County—from reduced energy and water use, waste disposal, etc.  
To Residents/Businesses—from energy/water conservation and reduced purchasing

## Benefits Other than CO2 Reduction

- Helping residents learn about their own carbon footprints permits choice in actions to take in reducing emissions, customizable to household/business budget, capabilities and resources.
- Engaging residents in action-oriented GHG reduction campaigns builds community, and educates regarding climate change, sustainability and resiliency.
- Actions taken to reduce carbon footprint often also result in water conservation, waste reduction, and other environmental benefits.

## Challenges & Anticipated Barriers

- Educating and engaging a large percentage of the community can be difficult but is achievable with diverse effort sustained over time.

## Community Outreach

- See above

## References/Resources

- Several household carbon footprint calculators are available, and most incorporate suggestions on actions to take to lower emissions. These include: *US EPA Household Carbon Footprint Calculator* (<https://www.epa.gov/ghgemissions/household-carbon-footprint-calculator>), and *CoolClimate Calculator*. App-based calculators, which use personal spending data to calculate emissions, include *Joro*, *OroEco* and *JouleBug*.
- Several platforms are available for community-wide engagement in GHG reduction initiatives, including *BrightAction* and *EcoChallenge*. These are customizable for a community’s needs (see *Eugene (OR) Carbon Free Challenge*). Other platforms include BeChange and Count Us In.
- Resources for carbon footprint estimation and mitigation for schools, businesses, local government and other entities will be evaluated for use in the County. For youth: <http://www.parkcitygreen.org/Calculators/Kids-Calculator.aspx> For businesses: <https://carbonfund.org/take-action/businesses/business-calculators/>, <https://www.greenplacestowork.com/> and <https://coolclimate.org/business-calculator>

**Recommendation 4: Reduce consumption-associated emissions by encouraging and supporting sustainable purchasing, use and disposal of food, goods and services by residents, businesses, government, schools and other entities**

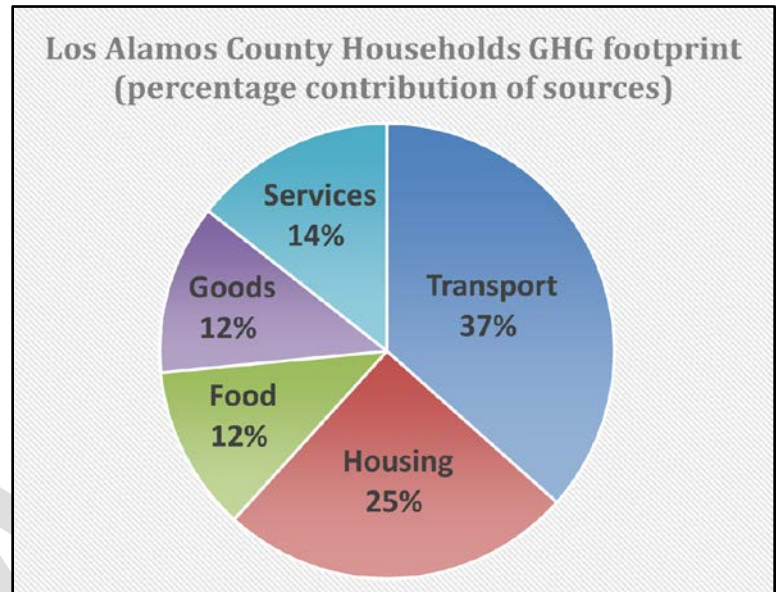
**Time Frame:** Immediate and Ongoing

**Background/Research/Data**

- GHG emissions resulting from the purchase of food, goods and services consumed in Los Alamos, although they are produced outside of the County, likely make up a substantial portion of carbon emissions for which we are responsible. (Graph based on data from Christopher M. Jones and Daniel M.

Kammen, [Spatial Distribution of U.S. Household Carbon Footprints Reveals Suburbanization Undermines Greenhouse Gas Benefits of Urban Population Density](#). *Environ. Sci. Technol.*, 2013, dx.doi.org/10.1021/es4034364.)

- Refrigeration, air travel and construction also have substantial associated GHG emissions.
- Reducing these is critical to achieving net zero emissions, and will also help address other sustainability issues, such as health, community resilience, waste and food insecurity.



**Outcome**

- Educational outreach to the community will result in better understanding of all sources of GHG emissions, their impacts, and ways to reduce them.
- Residents are empowered and encouraged to shift to lower-carbon diets and waste less food, resulting in improved health and cost savings.
- Increased local reuse and repair of material goods permits residents to reduce purchase of new goods. Residents build community connections and local resilience while saving money and reducing waste to landfill.
- Businesses and residents are encouraged to purchase non-hydrofluorocarbon (HFC) refrigerators, freezers and AC units (as needed), and educated on safe maintenance and disposal of appliances containing HFCs.
- Residents reduce air travel by shifting towards more local travel and greater ground transport. Businesses support methods for employees to work without long-distance travel to meetings, etc.
- County departments lead by example in utilizing lower carbon building materials in all CIP and other construction projects.



## Case Study/Public Education

The production and disposal of food accounts for as much as one-third of anthropogenic GHG emissions. Environmental Services data show that residents purchase significantly more food than they use, sending nearly 100 lb. of food per person per year to the landfill as waste. Since 2016, Environmental Services, the ESB and Zero Waste Team have implemented an extensive outreach program (“Save the Food”) to reduce food waste in all sectors of the community (residents, retail, restaurants and schools.) LAC County Council approved funding for this program in 2019, which enabled expansion of efforts. To date, the program has reached dozens of businesses and schools and thousands of residents, providing them with information and tools to prevent food waste and save money.



## Strategy

- Reduce the wasting of food and promote a shift towards healthy, lower-carbon food choices through educational outreach and support to residents, schools, restaurants and businesses. Continue and expand Environmental Services’ “Save the Food” campaign to involve all residents, businesses, schools and other entities. Support Farmers’ Markets, home gardening and community/school gardens, as well as local food rescue groups/food banks. Leverage the buying power of government, schools and community organizations to purchase low-carbon, minimally processed foods. Promote better food choices through nutritional and health counseling programs. Facilitate “gleaning” to channel surplus produce from home gardens to food banks.
- Promote a “circular economy” for material goods, emphasizing reduction of purchases through reuse, repair, sharing and recycling. Promote community “Fix It” clinics, rental businesses, thrift stores, tool lending “libraries”, and sharing groups. Encourage consumption of local services (such as gift cards for services) over purchase of material goods. Reduce use of disposable goods such as serveware, and emphasize purchase of durable, reusable goods.
- Assess current green purchasing policies used in County Gov’t and schools. Implement sustainable purchasing policies in County government and schools, requiring GHG emissions criteria to be considered in all purchases.
- Educate regarding HFCs, options for purchasing non-HFC appliances, and ways to safely dispose of appliances at end of life. Convene large entities using refrigeration (groceries, schools, LAMC) to ensure proper maintenance/leak prevention and disposal procedures are in use. Facilitate transport of residential refrigeration units to Eco Station for proper extraction and disposal of HFCs at end of life.
- Encourage reduction in air travel through promotion of local/regional travel, and options for businesses to conduct work without travel to meetings etc. Educate regarding how to reduce CO2 emissions from air travel (take direct flights, fly economy class, choose airlines using biofuels, purchase carbon offsets, etc.) County staff should lead by example.
- Promote shift to lower-carbon construction materials (low-carbon cement, supplementary cementitious materials, warm mix asphalt, etc.) and reduce use of virgin concrete, steel and asphalt through education, increased availability of alternative and recycled materials, and possibly building code adjustment. Promote deconstruction and reclamation of high-value materials, possibly through a “deconstruction ordinance.” Develop and implement GHG reporting criteria in planning all CIP construction projects.



## **Impact/Examples in Other Communities**

- Since 2011 The City of Paris, France has used its Health Nutrition Program to encourage residents to consume healthy, local, low-carbon foods. Minneapolis, MN schools developed “True Food, No Waste”, a comprehensive food waste reduction plan for all Minneapolis Public Schools.
- Portland, OR’s “Be Resourceful” campaign focuses on connecting residents to information and resources to get things they need through reuse, repair, renting and sharing, as well as “buy smart” strategies (plan purchases, buy low-C goods, buy durable goods, gift services, etc.)
- Eugene, OR plans to convene community partners who use refrigerants to identify options to reduce leaks from appliances and commercial refrigeration systems.
- The Town of Chapel Hill, NC provides builders with a list of building materials that are required to be recycled or salvaged when a building is being torn down and requires documentation of material recycling or salvage.

## **Economic Impact**

### **Costs:**

- Education/outreach will require staff time, and educational and promotional materials.
- Shifting to higher quality, lower carbon food and goods may have higher up-front costs.
- Replacement of HFC-containing appliances and AC units (at end of life) to ones containing non-HFC coolants will incur cost.
- Utilization of lower-carbon building materials will require staff time to research, and may be more costly to purchase and use.

### **Savings:**

- Shifting to a lower carbon diet with greater consumption of plant foods can have numerous health benefits and attendant savings. Reducing meat consumption can result in significant savings. Reducing food waste can save the average family of four \$1600/yr or more. Since food waste makes up 17% of what we send to the landfill, prevention of this waste reduces Environmental Services costs.
- Purchase of more durable goods, and increasing rental, repair, sharing and reuse of goods, can all save consumers money. Promotion of rental, repair and resale businesses supports local economy.
- Refrigerant extraction is currently a cost for Environmental Services. Shifting to non-HFC gases (which can be cheaply vented) will save on disposal costs.
- Local/regional travel (vs. overseas) can save vacation costs and support local tourism economy. Less business travel can result in significant cost savings.
- Use of reclaimed/recycled building materials may save on construction costs. EcoStation already collects construction debris, reuse of this would create a local market for that material.

## Benefits Other than CO2 Reduction

- Support of local/regional agriculture and home gardening, waste reduction, health improvement, air/water/land pollution reduction, reduction in agricultural use of land, water and other resources. Increase in donations to food banks, reducing food insecurity
- Promotion of sharing enhances social connection and community. Support of local businesses, services and non-profits involved in circular economy. Reduce waste to landfill. Reduce consumption of water, minerals, fossil fuels, labor, capital, etc. used to produce goods and services. Shift to use of services over purchase of material goods supports local businesses. Increase skills for resourcefulness and self-sufficiency
- Reduction of air travel can support local travel and tourism industries
- Reuse of reclaimed construction materials reduces landfill waste and use of virgin resources

## Challenges & Anticipated Barriers

- Since food is wasted at many points during its use, addressing all of these requires several behavior changes that may be inconvenient (meal planning, proper storage) or unwanted (eating leftovers.) Food choices are influenced by many important factors (culture, habit, economics, personal preferences), and shifting these can be difficult. Many high carbon foods (meat, dairy, etc.) and processed foods are heavily subsidized and sometimes less expensive than low-carbon plant foods.
- Purchase of new material goods can be more convenient than fixing existing goods or seeking out used materials. LAC lacks many options for repair or rental of goods. Some residents may feel that new goods are “better” than used. Advertising culture and retail merchants promote excessive consumption.
- Most release of HFCs is thought to occur during use of commercial refrigeration by businesses, over which there is no control or oversight.
- Options for long-distance travel from Los Alamos, other than by air, are limited.
- Availability of low carbon and/or recycled construction materials may be limited. Local contractors may lack knowledge of how to use low-carbon materials.

## Community Outreach

- See above

## References/Resources

- Project Drawdown (<https://drawdown.org/>) provides data and solutions for over 100 GHG sources. For example, it lists “Reduced Food Waste” and “Plant-Rich Diets” among the top four solutions having the most impact in reducing emissions worldwide.
- The USDN “Sustainable Consumption Toolkit” provides extensive resources to advance sustainable consumption in cities: [USDN Sustainable Consumption Toolkit](#), including a “Smart Shift” guide to help local governments promote sustainable consumption.
- The UN’s EAT-Lancet Planetary Health Diet outlines changes to the food system that reduce GHG emissions substantially, while improving human health: <https://eatforum.org/eat-lancet-commission/the-planetary-health-diet-and-you/>

- LAC Environmental Services “Food Waste Prevention” webpage ([https://www.losalamosnm.us/government/departments/public\\_works/environmental\\_services\\_division/food\\_waste\\_prevention](https://www.losalamosnm.us/government/departments/public_works/environmental_services_division/food_waste_prevention)) contains information on food waste, and how to prevent it. The US EPA’s “Sustainable Management of Food” page also has many helpful resources on food waste reduction (<https://www.epa.gov/sustainable-management-food/tools-preventing-and-diverting-wasted-food>).
- The West Coast Climate Forum’s “Climate-Friendly Purchasing Toolkit” provides guidance on specific purchasing strategies to reduce local governments’ carbon footprint: <https://westcoastclimateforum.com/cfpt>
- US EPA information on HFC refrigerants, their impacts, and legislation to phase-down their production in the next 15 yrs: <https://www.epa.gov/climate-hfcs-reduction> (NMED is also writing rules to mitigate HFC emissions, including entirely phasing out the use of HFCs in New Mexico.)
- Article on GHG emissions from air travel, and how to mitigate: <https://www.nytimes.com/2017/07/27/climate/airplane-pollution-global-warming.html>
- “Five Key Ways to Reduce GHG Emissions in Building Construction” <https://www.smartcitiesdive.com/news/5-key-ways-to-reduce-ghg-emissions-in-building-construction/564707/>



*Food Waste Prevention Toolkit materials distributed by Environmental Services Zero Waste Team to members of the community at outreach events*

## **Recommendation 5: Continue canyon restoration efforts around the county**

**Time Frame:** ongoing, will take multiple years of projects



### **Background/Research/Data**

Graduation Canyon restoration was a pilot project completed in 2019. It showed large gains in moisture retention, return of native species, and wetland habitat reestablishment.

### **Outcome**

- improve fire mitigation
- decrease storm water pollution
- prevent erosion
- allow native species and habitats to reestablish

### **Strategy**

○ Yearly money allocation to allow for grant applications to the state from joint county and contractor applications. Prioritize canyons based on discussions with fire chief, county trail specialists and relevant user community. Allocate a yearly financial commitment (<\$50,000) to successfully apply for state grants.

### **Economic Impact:**

- Anticipated costs: <\$50,000 yearly
- Anticipated benefits:
  - Potential for lower home insurance costs with decreased fire hazards and improved fire protection and erosion control
  - Decrease in stormwater runoff pollution may avoid future litigation.

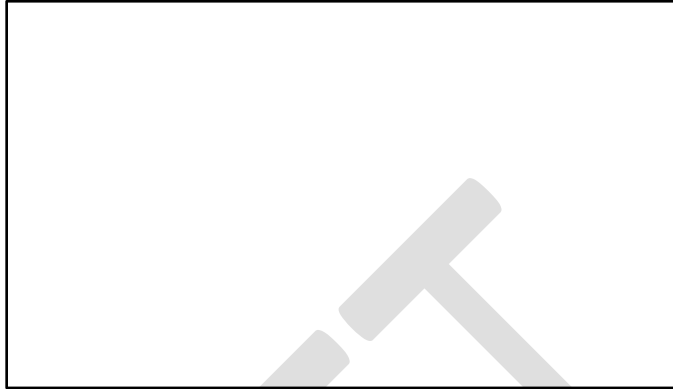
### **Benefits Other than CO2 Reduction**

- Fire mitigation
- Environmental stewardship (water quality, reestablishing native species and habitats)

**Challenges & Anticipated Barriers** none

### Community Outreach

- Encourage volunteers (through PEEC and county trails communities) to help maintain areas after restoration to continue keeping invasive species out.



### References/Resources

- <https://ladailypost.com/improvements-to-graduation-canyon-are-unveiled-to-county-public-during-tour/>



## Recommendation 6: Increase community's access and use of outdoors



**Time Frame:** ongoing

### Outcome

- Community appreciation for protecting open space
- Improvement in the mental, social and physical wellbeing of the community
- Provides community with activities with a lower carbon footprint
- Minimizes trips outside the community for similar activities/access
- Open space volunteer base growth

### Strategy

Improve access to and quality of existing open space opportunities by improving and maintaining trails, playground facilities, parks facilities, sports fields, rec paths etc.







- Put on frequent events for all age groups that involve activities outdoors on the open space, trails or recreation facilities



- Strongly encourage and actively support local organizations providing events that allow the community to be active and part of open space



## Economic Impact

- Anticipated costs: increasing current Parks and Rec budget to allow for optimal improvements and maintenance to open space and related facilities.
- Anticipated benefits:

- outdoor events will bring out of town participants who will spend money
- Increased health of the community may result in decreased personal health costs
- Growth of the volunteer base will result in improved maintenance, lowering maintenance costs for the county.

### **Benefits Other than CO2 Reduction**

- Community appreciation for protecting open space.
- Open space and recreation volunteer base growth.
- Improvement in the mental, social and physical wellbeing of the community.
- Provides the community with activities with a lower carbon footprint.
- Minimizes trips outside the community for similar activities.

### **Challenges & Anticipated Barriers**

- Improving the county system of supporting non-county events through easier permitting, better communication and improved collaboration.

### **References/Resources**

- <https://www.sciencedirect.com/science/article/pii/S014019711600049X>
- [https://greatergood.berkeley.edu/article/item/what\\_happens\\_when\\_we\\_reconnect\\_with\\_nature](https://greatergood.berkeley.edu/article/item/what_happens_when_we_reconnect_with_nature)
- <https://www.nps.gov/articles/naturesbenefits.htm>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5114301/>

**Recommendation 7: Test and record quality of water runoff and aquifer, including looking for chemicals commonly used such as herbicides, pesticides, plastics from synthetic sports fields, legacy (LANL) contamination etc.**



**Time frame:** medium, 1-2 years to plan and implement

**Outcome**

- Provide comprehensive water quality data over time
- Allow for understanding of the impact (if any) of chemical use as well as a way to quantify impact from changes to chemical use
- Allow for effective monitoring and early detection with an effective response if needed
- Protect waters and aquatic life downstream from pollution

**Strategy**

- Hiring an environmental contractor/consultant for testing and database setup

**Economic Impact**

- Anticipated cost: Cost of testing setup, monitoring of test sites, ongoing test costs, database work

**Benefits Other than CO2 Reduction**

- Improved water monitoring and ability for effective response to minimize pollution
- Data to help with potential litigation against the county regarding downstream or aquifer water quality
- Ability to show if certain actions give measurable results such as any relevant clean up work or any reductions in chemical use
- Public confidence in water safety

**References/Resources**

- [https://www3.epa.gov/npdes/pubs/msgp\\_monitoring\\_guide.pdf](https://www3.epa.gov/npdes/pubs/msgp_monitoring_guide.pdf)
- <http://www.fmtn.org/306/Stormwater-Management>