

Chapter 7

Transportation and Land Use Sectors

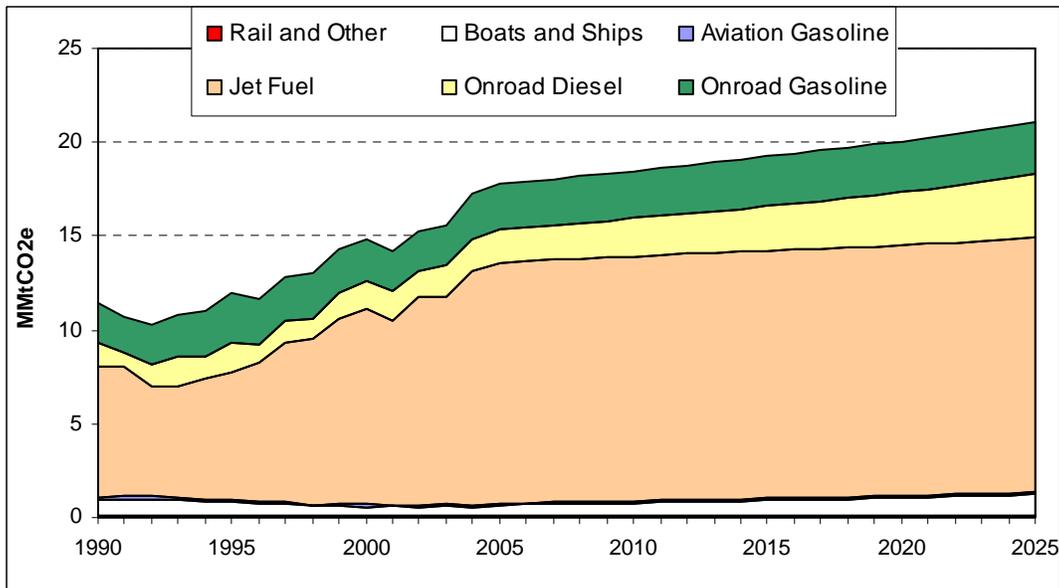
Overview of GHG Emissions

The transportation sector is a major source of greenhouse gas (GHG) emissions in Alaska, currently accounting for about 35% of the state’s gross GHG emissions. The transportation technologies and fuels used are key determinants of those emissions, along with population, economic growth, and land-use policies that all affect the demand for transportation services. Alaska’s GHG emissions from the transportation sector totaled about 18 million metric tons of carbon dioxide equivalent (MMtCO₂e) in 2005.

Figure 7-1 shows historical and projected transportation GHG emissions by fuel and source, and illustrates their rapid growth. Transportation emissions are expected to nearly double from 1990 to 2025. Jet fuel consumption accounts for the largest share of transportation GHG emissions by far, currently 72% of the transportation total. Emissions from jet fuel will continue to increase under reference case projections to 2025, although the rate of growth is projected to be smaller than that of on-road fuels. Aviation’s large share of emissions reflects Alaska’s dependence on air travel and role as a refueling stop for trans-Pacific flights.

Emissions from on-road vehicles (gasoline and diesel) currently make up 24% of total transportation GHG emissions. On-road GHG emissions will increase, as growth in vehicle miles traveled (VMT) is expected to outpace improvements in vehicle fuel efficiency. Emissions from marine vessels account for 4% of the transportation total, and are also expected to increase through 2025.

Figure 7-1. Historical and projected GHG emissions from the transportation sector, 1990–2025



GHG = greenhouse gas; MMtCO₂e = million metric tons of carbon dioxide equivalent.

Subsequent to the compilation of the inventory and projections, Congress enacted the 2007 Energy Independence and Security Act, which contained a provision for stricter Corporate Average Fuel Economy (CAFE) standards for cars and light trucks. This standard was classified as a “recent action” and was accounted for in the Transportation and Land Use (TLU) Technical Work Group analysis.

CCS performed an analysis of this new policy to determine the resulting reduction in the business-as-usual (BAU) projected transportation emissions in Alaska, represented in Figure 7-1. This analysis estimated the number of vehicles on the road that would be affected by the new standards, and then determined the amount of fuel saved by the efficiency improvements. Table 7-1 compares the BAU emissions from on-road vehicles to emissions under the new CAFE standard. By 2015, the new CAFE standard will result in a decrease in emissions of 0.01 MMtCO₂e in Alaska annually. By 2025, the fuel efficiency improvements will reduce transportation emissions by 0.73 MMtCO₂e annually, or 3.5% of total transportation GHG emissions in Alaska.

Table 7-1. Historic and projected emissions for the transportation sector (MMtCO₂e)—includes emission reductions estimated for recent actions

Emission Totals (MMtCO₂e)	1990	1995	2000	2005	2010	2015	2020	2025
<i>On-road Gas and Diesel (BAU)</i>	3.41	4.24	3.71	4.19	4.55	5.01	5.57	6.20
<i>On-road Gas and Diesel (CAFE)</i>	3.41	4.24	3.71	4.19	4.54	4.79	5.04	5.47
On-road Gas and Diesel Emission Reductions	0.00	0.00	0.00	0.00	0.01	0.22	0.53	0.73
Jet Fuel/Aviation Gas	7.15	6.94	10.59	12.94	13.14	13.31	13.44	13.65
Boats and Ships—Ports/Inshore	0.83	0.74	0.48	0.61	0.72	0.85	1.00	1.17
Boats and Ships—Offshore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rail	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.08	0.06	0.07	0.06	0.06	0.06	0.06	0.06
Total (BAU)	11.47	11.99	14.86	17.80	18.47	19.23	20.07	21.09
Total (CAFE)	11.47	11.99	14.86	17.80	18.46	19.01	19.54	20.36

BAU = business-as-usual; CAFE = Corporate Average Fuel Economy; MMtCO₂e = million metric tons of carbon dioxide equivalent.

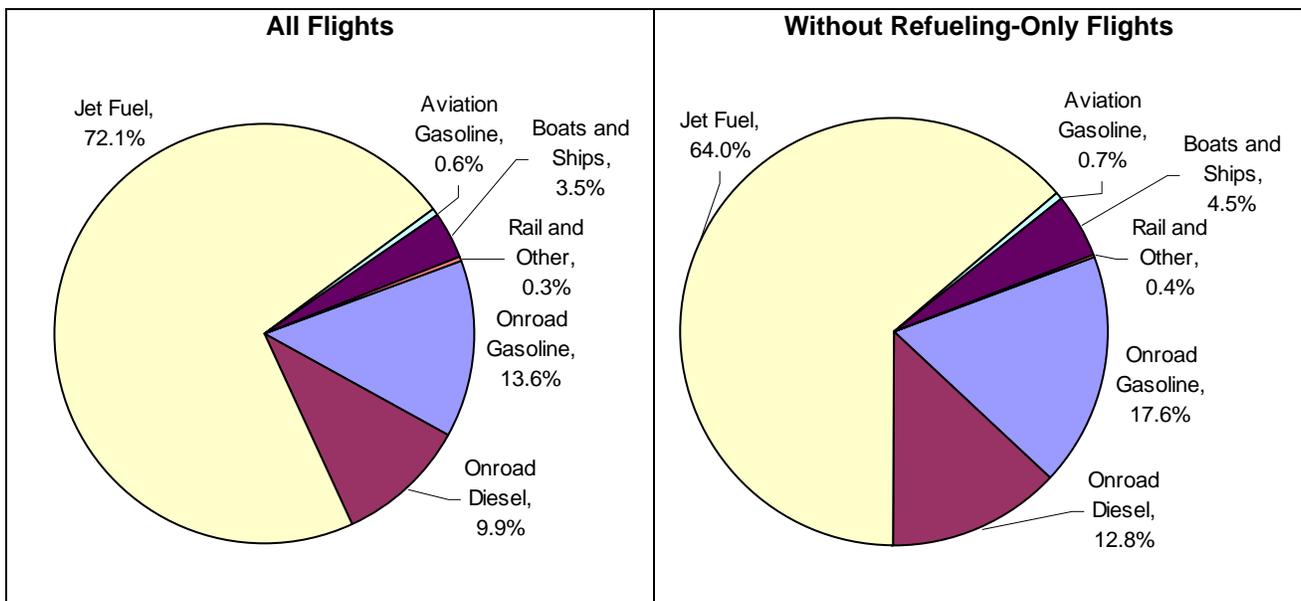
Key Challenges and Opportunities

Alaska is unique among U.S. states in that emissions from aircraft account for the majority of transportation GHG emissions. In most states, emissions from on-road vehicles make up two-thirds or more of transportation GHG emissions. Nationwide, on-road vehicles account for around 85% of transportation GHG emissions. Because Alaska is heavily dependent on air travel, aviation emissions dominate. Most travelers to and from the state use air transport, and air travel within the state is common. Alaska’s geographical position also contributes to aviation activity; Alaskan airports are stopover points for some flights that cross the Pacific Ocean.

In accordance with the protocol for quantifying GHG emissions, aviation emissions are calculated based on fuel sales. Many flights stop in Alaska for refueling only. An estimated

75% of international cargo flights, in addition to a small number of international passenger flights, stop in Alaska for this purpose. The emissions from the fuel these aircraft purchase in Alaska is counted in Alaska's inventory, even though the associated movement of cargo and passengers is unrelated to Alaska's economy. Emissions from these refueling-only flights account for roughly 31% of the jet fuel GHG emissions attributed to Alaska. Figure 7-2 shows Alaska's 2005 transportation GHG inventory with and without refueling flight emissions.

Figure 7-2. 2005 Transportation GHG emissions with and without refueling-only flights



GHG = greenhouse gas.

In general, the State of Alaska has very limited control over aviation emissions. Most of the aviation GHG emissions associated with jet fuel sold in Alaska are emitted in flight, outside of Alaska's borders. Because aviation systems are national and global in nature, Alaska has little ability to affect the practices of the aviation industry. In the United States, the Federal Aviation Administration (FAA) sets regulations and manages air traffic control systems that determine much of aircrafts' in-air operations. Some specific options for reducing emissions for aircraft include using alternative fuels and operational measures to save fuel. But alternative fuels for aircraft are still in the very early stages of development. And while some airlines have already instituted operational measures to save fuel, there is little Alaska could do to increase the financial incentive that commercial operations already have to reduce fuel use. Alaska's best opportunity for reducing emissions associated with aviation is probably to change ground operations at airports, including changes to ground support equipment.

At the same time, the importance of aviation to Alaska positions the state to be a major partner in efforts to reduce aviation GHG emissions at the national level. Alaska may be able to partner with commercial operations and with the FAA and other organizations to promote more GHG-efficient aviation.

On-road transportation emissions can be reduced through a combination of policies that improve vehicle fuel efficiency, substitute gasoline and diesel with lower-emission fuels, and reduce

vehicle travel. Using alternative fuels is more challenging in Alaska than in other states, because of Alaska's arctic climate and distance from the fuel production and distribution networks in the lower 48. Biofuels in particular present operational challenges in cold climates. More research is needed on appropriate alternative fuels for use in Alaska.

The reduction of per-capita VMT is a critical component of mitigating GHG emissions from the transportation sector. Expanded use of efficient land-use patterns can contribute substantially to this goal by reducing trip length and encouraging the use of transit, ridesharing, bicycling, and walking. A variety of pricing policies and incentive packages can also help to reduce VMT. The development of better planning methods and regulations and the increase of funding in support of alternative modes of transportation will be key mechanisms to achieve these goals. Reducing VMT is more feasible in urban areas than in rural areas.

Marine emissions are also relatively more important in Alaska than in many other U.S. states. The most straightforward way for the state to reduce marine emissions is by improving the fuel efficiency of marine vessels.

Overview of Policy Recommendations and Estimated Impacts

The Alaska Climate Change Mitigation Advisory Group (MAG) recommends a set of 10 policies for the TLU sectors that offer the potential for economic benefits and emission savings. These policy recommendations could lead to emission reductions from reference case projections of:

- 0.4 MMtCO₂e per year by 2025, and
- Cumulative savings of nearly 4 MMtCO₂e from 2010 through 2025.

The weighted-average cost of saved carbon from the policy options for which quantitative estimates of both costs and savings were prepared was \$95 per metric ton of CO₂ equivalent (tCO₂e).

The estimated impacts of the individual policies are shown in Table 7-2. The MAG policy recommendations are described briefly here and in more detail in Appendix J of this report. The recommendations not only result in significant emissions savings, but offer a host of additional benefits as well.

These benefits include reduced local air pollution, more livable, healthy communities, and economic development and job growth. For the TLU policies recommended by the MAG to yield the levels of savings described here, the policies should be implemented in a timely, aggressive, and thorough manner.

Table 7-2. Summary list of Transportation and Land Use policy recommendations

Policy No.	Policy Recommendation	GHG Reductions (MMtCO ₂ e)				Net Present Value 2010–2025 (Million 2005\$)	Cost-Effectiveness (\$/tCO ₂ e)	Level of Support	
		2015	2020	2025	Total 2010–2025				
TLU-1	Transit, Ridesharing, and Commuter Choice Programs	0.002	0.003	0.005	0.046	\$29.9	\$651	Unanimous	
TLU-2	Heavy-Duty Vehicle Idling Regulations and/or Alternatives	0.004	0.009	0.009	0.095	\$24.3	\$255	Unanimous	
TLU-3	Transportation System Management	0.006	0.006	0.006	0.092	–\$9.7	–\$105	Unanimous	
TLU-4	Promote Efficient Development Patterns (Smart Growth)	0.019	0.043	0.066	0.501	Net Savings	NQ	Unanimous	
TLU-5	Promotion of Alternative-Fuel Vehicles	0.026–0.084	0.054–0.173	0.09–0.288	0.669–2.139	\$207.3–\$494.8	\$135–\$740	Unanimous	
TLU-6	VMT and GHG Reduction Goals in Planning	0.019	0.043	0.066	0.501	NQ	NQ	Unanimous	
TLU-7	On-Road Heavy-Duty Vehicle Efficiency Improvements	a. SmartWay	0.050	0.075	0.084	0.930	–\$52.3	–\$56	Unanimous
		b. Phase Out	0.025	0.012	0.000	0.198	\$20.9	\$106	
		c. Public Fleets	0.016	0.033	0.037	0.364	NQ	NQ	
TLU-8	Marine Vessel Efficiency Improvements	0.012	0.022	0.032	0.269	\$20.4	\$76	Unanimous	
TLU-9	Aviation Emission Reductions	NQ	NQ	NQ	NQ	NQ	NQ	Unanimous	
TLU-10	Alternative Fuels Research and Development	NQ	NQ	NQ	NQ	NQ	NQ	Unanimous	
	Sector Total Before Adjusting for Overlaps	0.210	0.363	0.500	4.444	\$364.3	\$82		
	Sector Total After Adjusting for Overlaps	0.187	0.313	0.423	3.850	\$364.3*	\$95*		
	Reductions From Recent Actions	0.397	0.531	0.732	5.995	NQ	NQ		
	Sector Total Plus Recent Actions	0.412	0.844	1.155	9.845	NQ	NQ		

*Does not include any cost for policies TLU-4, TLU-6, or TLU-7c, but does include emission reductions for those policies.

GHG = greenhouse gas; MMtCO₂e = million metric tons of carbon dioxide equivalent; \$/tCO₂e = dollars per metric ton of carbon dioxide equivalent; NQ = not quantified; TLU = transportation and land use; VMT = vehicle miles traveled.

Note: Negative numbers indicate cost savings.

Technology is an important component of the recommended policies. Promotion of Alternative-Fuel Vehicles (TLU-5) could provide the greatest emission reductions of the policies proposed,

but the impact of the policy depends heavily on the propulsion technologies adopted. Electric vehicles could have around three times the impact on GHG emissions as vehicles powered by compressed natural gas. There is still some uncertainty about what alternative fuels and propulsion technologies are most appropriate for use in Alaska. Alternative Fuels Research and Development (TLU-10) would help to resolve this uncertainty and support the implementation of TLU-5.

While TLU-5 focuses on alternative fuels for light-duty vehicles, other proposed policies would promote technological improvements to heavy-duty vehicles. On-Road Heavy-Duty Vehicle Efficiency Improvements (TLU-7) proposes three mechanisms to improve the fuel economy of heavy-duty trucks and buses: retrofitting of existing vehicles with fuel-efficient technologies (SmartWay[®]); early replacement of older vehicles with newer, more fuel-efficient vehicles (Phase Out); and programs that promote improvements in fuel efficiency and use of alternative fuels specifically in public and private fleets. (Only public fleets were quantified in the analysis for this report.) An additional policy, Heavy Duty Vehicle Idling Regulations and/or Alternatives (TLU-2), could achieve modest reductions by decreasing unnecessary idling of heavy-duty vehicles. Less idling means less fuel consumed and fewer GHG emissions.

A number of policies would work together to reduce VMT by increasing the viability of alternative modes of travel and providing incentives to use alternative modes. These policies will require increased coordination between state government, local government, and businesses in many cases. Promote Efficient Development Patterns (Smart Growth) (TLU-4) presents the greatest institutional challenge. The promotion of more compact and mixed-use development patterns requires significant reform in local planning practices. Yet implementation of this policy is essential to make travel by walking, bicycling, and transit more feasible. In fact, transit use is on the rise nationwide and can be increased in many areas. TLU-1 (Transit, Ridesharing, and Commuter Choice Programs) is a policy package for the improvement, expansion, and promotion of public transit in Alaska's urban areas. VMT and GHG Reduction Goals in Planning (TLU-6) would support the implementation of both TLU-4 and TLU-1. TLU-6 would require both the state and municipal planning organizations (MPOs) to evaluate transportation GHG emissions and attempt to reduce per-capita VMT in areas where it is technically and economically appropriate.

One policy would reduce GHG emissions by improving the operations of existing roadways in Alaska, and by providing facilities for bicyclists and pedestrians as well. Transportation System Management (TLU-3) would promote the use of roundabouts, synchronization of traffic signals, light-emitting diode (LED) lights in traffic signals and street lamps, and reduced speed limits in some areas, among other measures.

Two policies target emissions from non-road transportation in Alaska. Marine Vessel Efficiency Improvements (TLU-8) would promote retrofitting existing marine vessels with more fuel-efficient engines. Aviation Emission Reductions (TLU-9) could be achieved by improving the operations of Alaska's airports, promoting the use of alternative fuels in aviation, and supporting improvements in federally managed aviation systems. While aviation is by far the largest source of transportation GHG emissions in Alaska, the state has a very limited ability to control the major factors that determine aviation GHG emissions. No emission reductions have been calculated for the short term.

There is overlap in the expected emission reductions among some of the policies within the TLU sectors; therefore, the GHG reductions resulting from individual stand-alone policies are not purely additive. In particular, policies that reduce VMT will erode the GHG benefits of policies that improve vehicle fuel economy or reduce fuel carbon intensity. Of policies that reduce light-duty VMT, TLU-4 and TLU-6 overlap entirely, having the same goal to reduce per-capita VMT. These goals also subsume the impact of TLU-1. To calculate the joint impact of policies on light-duty emissions, light-duty VMT and GHG emissions were calculated based on the combined impact of TLU-1, TLU-4, and TLU-6. The resulting emissions were reduced by the relative impacts of transportation system management (TLU-3) and use of alternative-fuel vehicles (TLU-5). Policies that affect emissions from heavy-duty vehicles primarily work by reducing the amount of fuel that vehicles consume, without changing the amount of travel by heavy-duty vehicles. It was assumed that there would be overlap between all of these policies (TLU-2, TLU-3, and TLU-7), as each subsequent measure would affect a more fuel-efficient baseline. Total fuel consumption and GHG emissions were estimated accounting for TLU-2, and the relative impacts of TLU-3 and TLU-7 were then applied. TLU-8 only affects marine vessels; therefore, it has no overlap with other policies. There is no overlap between TLU policies and those from the other sectors.

Transportation and Land Use Policy Descriptions

TLU-1. Transit, Ridesharing, and Commuter Choice Programs

The MAG recommends that Alaska provide the leadership and resources necessary to help expand the state's public transit and ridesharing system. To alter Alaskan driving habits to reduce GHG emissions, issues of convenience, choice, and finance must be major elements in expanded transit and ridesharing operations. Public education will also be paramount to success.

This policy would:

- Develop park-and-ride systems that are coupled to increased urban transit schedules. Estimates of new infrastructure will be needed in cold areas to keep car engines heated.
- Develop outlying collector routes with buses or vans to high-employment destinations—i.e., university campuses, oil industry offices, and state offices. A daytime shuttle or van offer to provide for personal lunchtime trips has been demonstrated in the private workplace.
- Provide funding support to expand the current transit systems' operations to increase the frequency of in-town schedules.
- Develop rail tie-in along existing track. Diesel multiple-unit cars from Wasilla to Anchorage and North Pole–University of Alaska Fairbanks campus through Fairbanks would be leased on an initial winter basis. Funding would be provided to invest in these cars and a program operator—a possible statewide or Regional Transportation Authority.

The Alaska Department of Transportation and Public Facilities (ADOT&PF) will help achieve an expansion of transit services in Alaskan communities, including coordinated transit solutions, and will seek additional funds to support this expansion.

The State of Alaska should also support the development of a Regional Transportation Authority in Anchorage and Fairbanks to integrate all alternatives into one coordinated regional system. This system would eventually include rail, bus transit, paratransit, and ferries, where appropriate.

Specific goals of the policy include:

- Double transit ridership in Alaska by 2025, compared to 2007 levels.
- Double vanpooling in Alaska by 2025, compared to 2007 levels.
- Increase the carpool mode share in Alaska by 2025.

This policy was unanimously approved by the MAG.

TLU-2. Heavy-Duty Vehicle Idling Regulations and/or Alternatives

The MAG recommends that the Alaska focus on reducing idling times for diesel and gasoline heavy-duty vehicles, buses, and other vehicles through a combination of statewide anti-idling regulations and by promoting and expanding the use of technologies that reduce heavy-duty vehicle idling. Through this policy, the state would:

- Develop and implement a statewide regulation banning extended idling by heavy-duty vehicles given accommodations for below-zero arctic and subarctic winter conditions, and provide local governmental units with model language for adoption of local anti-idling ordinances.
- Encourage and promote reduced idling through programs aimed at increasing voluntary adoption of idle-reduction technologies.
- Provide additional incentives to fleet or individual heavy-duty truck owners to purchase and install idle-reduction technologies on their vehicles. These incentives may come in the form of full grants, matching grants, tax credits, and low- or no-interest loans.

Alaska may also provide incentives to assist the private fleets to convert some of their vehicles to hybrid operation. Such engine technology is or soon will become available in the marketplace.

Alaska DOT&PF will lead by example with the installation of idle-reduction technology and/or idle-reduction policies/procedures for its fleet of heavy-duty vehicles. This goal will be phased to accomplish installation of these technologies or adoption of policies: 20% will be so equipped by 2012, with the remaining 80% equipped by 2020, with exception for vehicles used only seasonally.

This policy was unanimously approved by the MAG.

TLU-3. Transportation System Management

The MAG recommends that the Alaska seek to reduce GHG emissions from the transportation sector through improvements to transportation system management. These efforts would focus on the improvement, management, and operation of the transportation infrastructure, with a focus on the road and highway systems.

Specific policies include:

- ADOT&PF will encourage the installation of roundabouts. Roundabouts can reduce traffic queuing and delay, thus saving fuel and reducing GHG emissions; they also have safety benefits.
- To improve fuel economy and reduce GHG emissions per mile traveled, the state will reduce maximum speed limits on state highways to 60 miles per hour, or lower where appropriate.
- ADOT&PF will continue its commitment to providing a multimodal transportation system by continuing to invest in transit, bike, and pedestrian facilities.
- All urban areas (i.e., >5,000 population) will continue to include consideration of bike and pedestrian facilities in their urban transportation plans.
- ADOT&PF, in partnership with urban communities, will work to improve traffic signal synchronization on all state-managed routes (mostly arterials) in urban areas (i.e., >5,000 population) by 2012.
- ADOT&PF will complete conversion of all traffic lights to LED bulbs by 2010, and will work with cities to convert roadway luminary lighting under city jurisdiction.
- All urban transportation plans will be updated by 2012, with an emphasis on operations and safety. The operations elements in urban transportation plans will improve traffic flow and reduce conflict points, and can result in turn lanes, reconfiguration of intersections, or access control.
- Congestion management plans for all high-traffic-volume construction projects will be considered by ADOT&PF.
- Access management will continue to be pursued consistent with Alaska statutes and ADOT&PF policies. Access management is intended to reduce the number of street and driveway access points to major roads and highways, in order to reduce conflict points.
- The state will install traffic management technologies and provide public information of travel conditions on high-volume commuter routes, especially those lacking practical bypasses. ADOT&PF, along with partner communities, will complete by 2010 a comprehensive ITS Plan for the Glenn Highway corridor between Anchorage and the Mat-Su valley.
- The state will improve the manner in which incidents and accidents on high-volume routes are processed, and will require drivers involved in crashes to pull away from travel lanes.

This policy was unanimously approved by the MAG.

TLU-4. Promote Efficient Development Patterns (Smart Growth)

The MAG recommends that Alaska promote efficient, sustainable (i.e., smart growth) land development patterns to complement transit improvements, and sustained implementation of multimodal links to facilitate biking, walking, and winter trail use in residential and urban areas.

This policy will focus on promoting land-use changes that result in higher densities in developed, urban areas. It will also focus on incorporating retail zones and small limited commercial nodes in residential developments, with a goal of reducing driving needs by facilitating walking or bicycling, and also reducing the length of driving trips.

The Alaska Department of Education will require school boards in selecting new school sites to favor sites that can be reached by walking and biking for the majority of the population the school will serve.

Additional issues and items to be developed would include:

- State policy issues detailing funding parameters and funders' policies distributing state and federal dollars.
- Changes to state laws and regulations.
- Local development plans—e.g., *Anchorage 2020*,¹ Fairbanks North Star Borough Regional Comprehensive Plan.
- Local zoning code changes.
- Increased urban/residential density factors.
- Land “disposal” sales and auctions, including the University of Alaska and the Alaska Mental Health Land Trust.
- Subdivision codes and standards to set aside people-friendly open spaces and greenbelt reserves.
- Tax credits/incentives to developers.
- Must be combined with infrastructure planning—roads and utilities.
- Public buy-in is a must. There must be strong incentives to have people accept programs.

This policy was unanimously approved by the MAG.

TLU-5. Promotion of Alternative-Fuel Vehicles

The MAG recommends that Alaska promote the use of alternative-fuel vehicles (AFVs) in the light-duty fleet, including vehicles powered by natural gas, propane, biodiesel, electricity, ethanol, hydrogen, and fuel cells, and hybrid vehicles that use more than one power source.

¹ See: http://www.muni.org/Planning/prj_Anch2020.cfm.

This mitigation policy consists of two parts: (1) working toward the replacement of existing light-duty vehicle fleets with AFVs, and (2) better informing the public of the benefits of purchasing AFVs and providing incentives as well. The policy's specific goals are:

- Increase the use of light-duty AFVs by public-sector agencies and private-sector firms to 25% of on-road fuel consumption by 2020 and 35% by 2030.
- Increase the use of AFVs by consumers to 10% of on-road fuel consumption by 2020 and 25% by 2030.
- Ensure that the AFV technologies chosen produce a minimum 15% life-cycle reduction in GHG emissions per mile, compared to conventional fuels.

This policy was unanimously approved by the MAG.

TLU-6. VMT and GHG Reduction Goals in Planning

The MAG recommends that Alaska require all significant transportation system plans developed at the state and MPO levels, and all actions that would change or provide a new mode of transportation or enlarge capacity, to have an evaluation of their contributions to GHG emissions. Currently, traffic models to assist in such evaluations exist only at the metropolitan level in Alaska; thus, time may be needed to develop tools for non-metropolitan areas.

The goal of the policy is to reduce the per-capita light-duty VMT in communities that offer transit services by 1% by 2015 and 3% by 2025. To implement this policy:

- The two MPOs—the Fairbanks Metropolitan Area Transportation Study (FMATS) and Anchorage Metropolitan Area Transportation Solutions (AMATS)—would work with ADOT&PF to develop consistent methods to evaluate GHGs from transportation system plans and relevant projects by the end of 2010.
- The state legislature would enact a policy that requires per-capita reductions in VMT in communities that offer transit services.

This policy would support and promote public and private planning and development practices, including smart growth planning (see TLU-4) and infrastructure provisions, such as expanded opportunities for non-vehicular travel that reduce the number and/or length of trips made in Alaska.

This policy was unanimously approved by the MAG.

TLU-7. On-Road Heavy-Duty Vehicle Efficiency Improvements

The MAG recommends that Alaska create new services and provide additional support to existing voluntary and incentive-based programs that help public and private on-road heavy-duty diesel-powered fleets reduce GHG emissions.

This policy employs a combination of three primary strategies to achieve GHG emission reductions:

- Develop incentives to encourage public and private on-road diesel fleets to participate in the EPA Smart Way[®] Transport Partnership Program.
 - Goal: Achieve the following public and private fleet participation in Smart Way[®]: 30% of total trucks in Alaska by 2012, and 50% by 2020.
- Provide incentives to phase out “old” (1988 and older) high-GHG-emitting on-road heavy-duty diesel engines, and replace them with modern lower-GHG-emitting diesel engines if appropriate. Vehicles replaced by the program must be permanently scrapped in order to achieve a net emission reduction. They may not be sold into the used truck market.
 - Goal: Phase out 50% of “old” (1988 and older) high-GHG-emitting on-road heavy-duty diesel engines by 2015.
- Develop incentives for state, borough, and municipal government-managed vehicle fleets to develop and implement plans to reduce GHG emissions from their public transit, school bus, and maintenance vehicles. Examples could include idle-reduction strategies, alternatively powered engines—liquefied natural gas, natural gas, electric, hybrid, resource sharing etc.
 - Goal: Achieve a minimum 20% GHG emission reduction from the 2008 benchmark by 2020.

This policy was unanimously approved by the MAG.

TLU-8. Marine Vessel Efficiency Improvements

The MAG recommends that Alaska promote efficiencies and conservation options for commercial fishing, recreational fishing, marine tourism, and other forms of marine transportation.

- Provide financial incentives, such as low-cost loans, that would encourage vessel owners to implement changes without unduly compromising industry economics.
- Encourage federal and state agencies that regulate commercial fishing to consider GHG emissions when making policy decisions. Efficiency improvements relating to conduct of a given commercial, commercial sport (charter), recreational, personal use, or subsistence fishery are regulatory in nature and would require action by the Alaska Board of Fisheries.

This policy was unanimously approved by the MAG.

TLU-9. Aviation Emission Reductions

The MAG recommends that Alaska support measures to reduce GHG emissions from operation of airports and aircraft in the state.

This mitigation option includes three components:

- Support the FAA in the redesign and improvement of the existing, outdated, air traffic management system through the implementation of the Next Generation Air Transportation System (NextGen) project.
- Identify existing and new operational best practices for maximizing fuel efficiency in the aviation sector, facilitate (including through financial incentives) voluntary implementation of such practices where practical, and evaluate resulting emission benefits where possible.
- Adopt a clear statement that it is the policy of the State of Alaska to facilitate the rapid introduction of alternative fuels for aviation that both are economically viable and have a reduced emissions profile on a life-cycle basis.

In addressing GHG emissions from the aviation sector, Alaska must take into account its unique interests in the sector, the policies and practices of other states and territories, and other national and international laws and policies affecting aviation and environmental goals.

This policy was unanimously approved by the MAG.

TLU-10. Alternative Fuels Research and Development

The MAG recommends that Alaska support research and development of alternative transportation fuels that are feasible in the Alaska climate, result in significant life-cycle GHG reductions when used in Alaska, and can benefit Alaska's economy. Research should focus on existing alternative propulsion technologies and methods to make existing technologies more viable in Alaska, rather than on development of new propulsion technologies.

Specifically, the state of Alaska and research partners should:

- Determine the market potential, cost, and GHG impacts of existing alternative fuel and vehicle types in Alaska.
- Determine methods to encourage the in-state production and use of alternative fuels.

This policy was unanimously approved by the MAG.