

**ROVER III Project: On-Road Vehicle Emissions Testing Study
and Path Forward**

Project Charter

Approved by the CASA Board of Directors

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ROVER III Project Charter

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Introduction

The Government of Alberta has committed to implementing the Canadian Ambient Air Quality Standards (CAAQS) as part of the national Air Quality Management System. Air emissions need to be managed for Alberta to achieve the CAAQS as they become more stringent over time.

In particular, careful management of emissions of nitrogen oxides (NO_x) will be needed and the Clean Air Strategy highlights the need for management actions on non-point sources of air emissions, such as transportation emissions. Based on the 2014 Air Pollutant Emissions Inventory, the transportation sector is one of the largest sources of NO_x emissions in the province, second only to industrial emissions and contributing approximately 30% of total NO_x emissions. The transportation sector is province-wide. In addition to emitting NO_x and other air contaminants with associated health impacts, the transportation sector is a notable emitter of greenhouse gases.

The Government of Alberta, led by Alberta Environment and Parks, identified an opportunity for a CASA Project Team to support CAAQS implementation and general air quality management. This work will involve: an on-road vehicle emissions testing study to gather information on in-use vehicle emissions and inform next steps for vehicle emission reductions, while leveraging existing communication channels for messaging on vehicle emissions and their impact on air quality. This project can also support alignment of provincial initiatives with the intent of federal legislation to reduce both air and greenhouse gas emissions from vehicles.

This project charter outlines the work as well as its suitability to the CASA process.

Background

The CASA Project on Non-Point Sources (2015-2017) was tasked with helping to address non-point source air emissions contributing to ambient fine particulate matter (PM_{2.5}) and ozone (O₃) standard non-achievement in Alberta, and had a large focus on the transportation sector. This project charter was informed by draft recommendations from that project.

Based on the 2014 Air Pollutant Emissions Inventory, the on-road transportation sector is a large emission source of NO_x (particularly heavy-duty diesel vehicles, followed by light-duty gasoline trucks and other vehicles), a source of volatile organic compounds or VOCs (particularly light-duty gasoline trucks and other vehicles), and a source of primary PM_{2.5} (particularly heavy-duty diesel vehicles). In 2012, the International Agency for Research on Cancer (IARC) classified diesel engine exhaust as carcinogenic to humans based on evidence that exposure is associated with an increased risk for lung cancer¹. More recently, Health Canada published a document that categorizes the relationship between lung cancer and diesel

¹ Reference: International Agency for Research on Cancer. (2014). Diesel and Gasoline Engine Exhausts and Some Nitroarenes / IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. [PDF, ISBN 978 92 832 01434, ISSN 1017-1606] Lyons, France: International Agency for Research on Cancer, pp. 39-484. Available at: <http://monographs.iarc.fr/ENG/Monographs/vol105/mono105.pdf> [Accessed 13 Dec. 2017].

exhaust as causal based on a weight-of-evidence analysis of epidemiological data as well as identifying a suggestive relationship between bladder cancer and diesel exhaust².

An innovative on-road vehicle emissions testing study could help 1) characterize emissions from in-use vehicles (e.g., determine which ages and classes of vehicles have the highest and lowest emissions and whether emissions reality matches perception) in a particular area such as within the Edmonton to Calgary corridor, or other, 2) identify potential impacts of program and policy options (e.g., design to target highest emitters), and 3) test the feasibility of integrating emissions testing into program options (e.g., for identifying high emitters). In addition to data gathering, this would also be an ideal opportunity for education/awareness on vehicle emissions and their impact on air quality.

A similar, short-term study was conducted in British Columbia in 2012³, where emissions data for nitric oxide, particulate matter, hydrocarbons, carbon monoxide, and carbon dioxide were collected for a variety of diesel vehicles and model years using a remote sensing device (RSD) system and a heavy-duty emissions tunnel (HDET). These newer technologies provide data beyond the snap acceleration smoke test, used for tailpipe testing, which has limitations for measuring particulate matter and does not measure NOx.

Furthermore, the earlier ROVER (Roadside Optical Vehicle Emissions Reporter) I and ROVER II projects were completed in Alberta through CASA. In 1998, the ROVER project assessed actual in-use vehicle emissions using a remote sensing van equipped to measure exhaust emissions including carbon monoxide. It also communicated with Albertans about vehicle emissions. During ROVER I, over 42,000 light-duty vehicles were tested in four municipalities. In 2006 the project was repeated as ROVER II, testing over 66,000 vehicles in Edmonton, Calgary, Red Deer, and Canmore. This time the team measured exhaust emissions of nitric oxide, particulate matter, hydrocarbons, carbon monoxide, and carbon dioxide. ROVER II found emissions per kilometer were falling but vehicle use was increasing. Furthermore, the results indicated that although the number of higher emitters was relatively small at 5%, they contributed a larger proportion of emissions (60% of carbon monoxide, 31% of hydrocarbons, 26% of nitric oxide, and 7% of particulate matter).

At the CASA Board meeting on September 30, 2010, in advance of the renewed Clean Air Strategy, the Board reviewed the CASA Vehicle Emissions Team Final Report to the CASA Board and agreed upon the following consensus statements:

1. Transportation-related air emission issues continue to exist.
2. Understanding the Clean Air Strategy and its guidance will be important in developing future work on transportation emissions.

² Government of Canada. (2016). Human Health Risk Assessment for Diesel Exhaust. [PDF, Cat.: H129-60/2016E-PDF, ISBN: 978-0-660-04555-9, Pub.: 150239] Ottawa, Ontario: Health Canada, pp. 1-38. Available at: http://publications.gc.ca/collections/collection_2016/sc-hc/H129-60-2016-eng.pdf [Accessed 13 Dec. 2017].

³ Reference: Greater Vancouver Regional District Remote Sensing Device (RSD) Trial for Monitoring Heavy-duty Vehicle Emissions, Envirotec Canada, March 2013

3. Stakeholders are encouraged to bring a statement of opportunity to CASA, at an appropriate time, to address these issues.

The additional step in this project includes recommending management actions and/or next steps for vehicle emission reductions, such as for highest emitters, which would be informed by the emissions testing study, reference material on management actions implemented in other jurisdictions, and discussions with key stakeholders.

Scope

The work of the project team will be limited to using remote sensing technology to test emissions from the in-use on-road vehicle fleet, including heavy-duty and light-duty trucks/vehicles, and making recommendations on managing emissions from the on-road transportation sector.

The focus of this work is intended to be diesel-fuelled trucks but would also collect data on other heavy-duty vehicles (e.g., buses) and light-duty vehicles (e.g., personal vehicles). The emissions of focus include NO_x, VOCs, CO, CO₂, and particulate matter for a holistic approach (selected air contaminants and greenhouse gases) but recommendations to reduce these substances is expected to have the co-benefit of reducing other emissions.

Project Goal

To measure emissions from the in-use on-road transportation sector, particularly diesel-fuelled trucks, to inform management actions and/or next steps for transportation emissions management to help achieve the CAAQS in Alberta.

Project Objectives and Strategies

The 'Potential Outcomes/Deliverables' under each objective are not meant to be prescriptive or limit the creativity of the project team, rather to provide additional context around the intent of the objectives. They are meant to help inform discussions of the project team by providing an understanding of Working Group conversations. The project team members will create more detailed work plans which will outline how each strategy is to be executed. As they do so, specific outcomes and deliverables will be identified based on what is most appropriate and useful to achieving each objective.

1. Objective 1

Compile and review information and agree on a common understanding of current transportation emissions and their management in Alberta.

Strategies

- 1.1. Gather and review existing and planned work on current transportation emissions and their management in Alberta and other jurisdictions.

- 1.2. Determine any permits or permissions required to undertake the on-road vehicle emissions testing study and the time required to obtain them.

Potential Outcomes/Deliverables

- Understanding of work being done in Alberta and elsewhere to measure and manage transportation emissions.
- Summary document: List of reference materials on similar and related work on transportation emissions and management in Alberta and other jurisdictions.

2. Objective 2

Undertake an on-road vehicle emissions testing study (or studies) to gather data on emissions from in-use on-road light-duty and heavy-duty vehicles, focusing on diesel-fuelled trucks.

Strategies

- 2.1. Define the scope of the on-road vehicle emissions testing study including the emission parameters and vehicles of focus (e.g., on-road heavy-duty diesel and/or light-duty diesel vehicles) given available funding.
- 2.2. Confirm availability of the potential contractor(s) and initiate a contract for the on-road vehicle emissions testing study.
- 2.3. With input from the consultant, outline the design of the emissions testing study including the number and location of testing sites for representativeness given available funding, the desired time periods for data collection, and how to address any limitations or risks. The testing site determination must also consider CAAQS achievement (PM, O₃, NO₂), areas where the vehicles of focus frequent (e.g., trucks and commercial buses in Fort McMurray, main travel corridors), and the locations used in previous similar studies (Calgary, Edmonton, Red Deer, and Canmore).
- 2.4. Obtain any necessary permits or permissions for data collection (e.g., testing site set-up authorization and selected vehicle registration information gathering).

Potential Outcomes/Deliverables

- Study is undertaken and data are collected for the vehicles of focus, emission parameters, and locations during the desired time period(s).

3. Objective 3

Develop a vehicle emissions profile for the in-use on-road vehicle fleet based on data from Objective 2 and compare results from this and similar studies.

Strategies

- 3.1. Evaluate and summarize the data collected during the on-road vehicle emissions testing study to characterize the fleet. This includes identifying which model years, classes of vehicles, and fuel types are the lowest and highest emitters. If possible, this would also include comparing emissions profiles of vehicles enrolled in an appropriate program available at the time of the emissions testing study, such as the Partners in Compliance (PIC) program or the SmartWay Transportation Partnership, vs. those not enrolled.

- 3.2. Compare results between the different ROVER III testing sites (e.g., between Fort McMurray and elsewhere) and between ROVER III and similar studies from British Columbia, Alberta, or other jurisdictions highlighting any key similarities or differences.

Potential Outcomes/Deliverables

- On-road vehicle emissions testing study report is completed and includes characterization of the fleet and highlights any key results or insights.
- Data collected provided separately to the report in a format to be decided by the contractor(s) and the project team.

4. Objective 4

Evaluate and recommend management actions and/or next steps to reduce emissions from the in-use on-road vehicle fleet based on the outcomes of Objectives 1 and 3.

Strategies

- 4.1. Develop a list of potential management actions and/or other next steps for implementers (i.e. Governments, Airshed Organizations, etc.). Additional inputs or considerations should include:
 - Input from key stakeholders;
 - Considerations for socioeconomic concerns, any advantages or disadvantages to affected stakeholders, and alignment of provincial initiatives with federal legislation with the intent of reducing both air and greenhouse gas emissions from vehicles;
 - Evaluation of potential management actions and/or next steps for emitters, leveraging existing available information wherever possible. Some considerations may include:
 - cost/benefit analysis
 - ease of implementation
 - feasibility of integrating emissions testing into program options (e.g., for identifying high emitters on a more ongoing basis).

Potential Outcomes/Deliverables

- Recommendations for management actions and/or next steps to help reduce emissions from the transportation sector in Alberta, that are complementary to, rather than duplicative of, initiatives that are existing or already planned.

5. Objective 5

Develop and implement a strategy and action plan for communicating the work of the project team, and on vehicle emissions and their impact on air quality.

Note: Objective 5 will need to be considered at the outset and on an ongoing basis to determine what stakeholder and public engagement will be necessary and/or appropriate at each stage of the project.

Strategies

- 5.1. Identify existing communication channels that could be leveraged.
- 5.2. Determine relevant information to be communicated, the appropriate audience, timing, and how it will be communicated.
- 5.3. Engage stakeholders as required throughout the project.
- 5.4. Provide advice on stakeholder and public engagement to the implementers of management actions, where applicable.
- 5.5. Develop messaging on the outcomes of each objective for project team members to communicate relevant information to their constituents.

Potential Outcomes/Deliverables

- Communications strategy detailing what, how, when, and to whom project team information will be communicated.
- Message map for communicating on vehicle emissions and their impact on air quality via existing communications channels.
- Survey of selected audience(s) to inform future education/awareness activities, e.g., to gauge awareness, encourage good performers, and/or debunk any myths.

Project Deliverables

The project team will provide the following deliverables:

- Consultant report containing a description and the results of the vehicle emissions testing study, and includes comparisons of results to similar studies in Alberta and other jurisdictions and of those enrolled in the PIC program;
- Data collected during the emissions study;
- Final report that includes the project methodology, findings, outcomes, and recommendations including any advice to implementers of potential management actions and/or next steps; and
- Communications strategy for dissemination of the findings and results of the project
- Performance measure(s).

It should be noted that *CASA's Performance Measures Strategy: A "how-to" guide to performance measurement at CASA* indicates that each project team is required to generate one specific metric that will allow the success of the team to be evaluated 5 years in the future. More guidance on how this can be achieved can be found in the strategy.

Project Structure and Schedule

Project work should begin in April 2018. The working group anticipates that the entire project will take a maximum of 18 months, with a completion date of September 2019. The project team will complete its objectives within 12 months, with the remaining time allocated for report writing and review of the final report by the CASA Board.

The bulk of the work is sequential, meaning that the outcomes of Objective 2 are the inputs to Objective 3, and the outcomes of Objectives 1 and 3 are the inputs to Objective 4. The project team should also assess the entire process to identify opportunities for work to be done concurrently.

Refer to Table 1 for a high-level illustration of the process and information on the time constraints related to Objective 2.

Table 1: ROVER III Project Timeline*

ROVER III Project Team Objectives and Timeline	2018									2019								
	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Objective 1: Compile and review information and agree on a common understanding of transportation emissions management in Alberta.	Blue																	
Objective 2: Undertake an on-road vehicle emissions testing study (or studies) to gather data on in-use vehicle emissions, focusing on diesel-fuelled trucks.		Green																
Objective 3: Develop a vehicle emissions profile for the in-use fleet based on data from Objective 2 and compare results from this and similar studies							Brown											
Objective 4: Evaluate and recommend strategies or management actions to reduce emissions from the in-use vehicle fleet.										Purple								
Objective 5: Develop and implement a strategy and action plan for communicating on vehicle emissions and their impact on air quality, and the work of the project team.	Yellow																	
Write final report and recommendations											Light Green							
Final report and recommendations reviewed approved by the CASA Board (timing to align with Board meeting schedule)																	Red (dashed border)	

*The schedule outlined in Table 1 **can only be delayed by 1-2 months** without significantly impacting the overall project timeline. If Objective 2 is not initiated by June 2018, the data collection window will be missed and the project will be delayed by 6-12 months.

Projected Resources and Costs

Table 2 outlines the potential external costs over the life of the project as anticipated by the working group. These figures are estimates only. As the work of the project team progresses, detailed work plans and associated budgets will need to be created. The funds to complete this work will need to be assured prior to the commencement of the project. Note that the bulk of the funding will likely be required in implementation of Objective 2, which occurs early in the project.

The funding for Objective 2 is required upon project initiation to secure the contractor(s) and ensure they can undertake the emissions testing study during the required data collection window in Fall 2018. If funding is not available when the project is initiated, the project timeline will be delayed 6 – 12 months.

Table 2: Estimated ROVER III Project Budget

Item	Comments	Estimated Cost
Consultant fees to undertake Objectives 2 and 3, as follows: <ul style="list-style-type: none"> Complete an on-road emissions testing study (or studies) for the vehicles of focus during the desired time period(s) Develop a vehicle emissions profile for the in-use on-road vehicle fleet and compare results from this and similar studies 	<i>Critical cost</i> requiring funding for project commencement	\$150,000*
A workshop to obtain feedback on and refine management actions with interested parties (Objective 4)	Optional cost, cost may be reduced	\$5,000
Development and implementation of communications strategy (Objective 5), to potentially include: <ul style="list-style-type: none"> Workshop with interested parties Survey of selected audiences Communications materials (e.g., message map, backgrounder, etc.) 	Optional cost, cost may be reduced	\$10,000
Final Report Writing	Cost may be reduced	\$10,000
Total Estimated External Costs		\$175,000

*In-depth discussion of the Project Team is needed to confirm the scope of the Request for Proposal, particularly as the costs vary by the number of testing sites and time in the field. This estimate assumes five testing site locations (one week in the field at each site) and a final report including a summary of the collected data and a vehicle emissions profile. The cost associated with each testing site is approximately \$25,000 and a further \$25,000 is required for

the consultant’s report. The more testing data obtained, the more representative the study results may be of the vehicle fleet.

Risk Analysis

Identifying, analyzing and mitigating project risks is a key component of executing a successful project. The project team should incorporate proactive risk management into the project to mitigate risks that could undermine its success.

Table 3 lists the risks as well as possible mitigation strategies identified by the working group that the project team should consider as they undertake their work.

Table 3: ROVER III Risk Analysis including Possible Mitigation Strategies

Risks	Possible Mitigation Strategies
Process	
Timely funding not available	<ul style="list-style-type: none"> • Identify who the “customers” of this work are. Who will find this valuable – seek funding there • Develop a strong value-proposition that includes: examples of sectors that may be involved or affected • Project Team members discuss the work and associated need for funding with their constituents early in the process
Recommended management actions are too broad or not specific to the project goal.	<ul style="list-style-type: none"> • Seek a balance between regional needs and provincial applicability in management actions chosen • Consider prioritizing cross-cutting actions that provide regional benefit and have the potential to be broadly applicable • Consider ways to align this work with existing management frameworks and plans
Can’t reach agreement, e.g., on testing study design, management actions, or communications	<ul style="list-style-type: none"> • Determine in advance which pieces of work do and do not require consensus • Outline a clear decision-making process that includes what happens if the team can’t agree – who will make the decision? • Have an explicit discussion around Interest-Based Negotiation, and get all the interests of the team members on the table
Project Team doesn’t understand or follow the Project Charter	<ul style="list-style-type: none"> • Working group to create a project charter that is clear, especially with respect to the intent for sequencing of objectives • Board receives regular updates to ensure progress is monitored

CASA Board doesn't agree with management actions identified in Objective 4	<ul style="list-style-type: none"> • Project Team members liaise with their constituents and Board members on an ongoing basis • Project Team provides regular status reports for Board meetings
Recommendations of the project team are not implemented. Specifically, advice given on implementing management actions in Objective 4.	<ul style="list-style-type: none"> • This risk is outside the scope of the project team to mitigate; however, this risk will be reduced if i) the parties potentially involved in implementation are engaged, and ii) reference to implementation (who and how) is included in the report's recommendations
Information Collection	
Permits for data collection are not obtained in a timely manner and cause project delays	<ul style="list-style-type: none"> • Municipal representatives are involved early in the project and can inform the project team of the required permits and timelines for acquisition to ensure they are obtained prior to the data collection window • Similarly engage Service Alberta regarding access to vehicle registration information for vehicles registered in the province
Consultant is not available during the project data collection window	<ul style="list-style-type: none"> • Engage the consultant as far in advance as possible to ensure availability (e.g., once project charter is approved by the CASA Board)
Lack of / limited information (accessibility)	<ul style="list-style-type: none"> • Ensure Project Team membership enables the team access to information • Use judgement where information is unavailable
Privacy concerns potentially impacting the ability to collect vehicle registration data and use limitations cause project delays or impact the study results	<ul style="list-style-type: none"> • Determine requirements and data use limitations for vehicle registration data early in the project (e.g., once project charter is approved by the CASA Board)
Technology limitations (e.g., due to weather conditions) cause project delays	<ul style="list-style-type: none"> • Allow sufficient time during the data collection window for potential delays due to unfavourable weather conditions
The optimal data collection window is missed and the project as a result takes longer than expected	<ul style="list-style-type: none"> • Plan clear objectives and requirements for each stage of the project to ensure any requirements (e.g., permits, consultant availability) are met early in the project
Ability to collect vehicle age and class data for different vehicle types is not considered and the information is not obtained	<ul style="list-style-type: none"> • Ensure the emissions testing study is adequately scoped and designed in terms of target vehicles and the necessary equipment set up to collect both the emissions information and the vehicle registration information (e.g., difference in license plate location on heavy-duty vs. light-duty vehicles is considered)

Difficulties in collecting registration data from out-of-jurisdiction vehicles impact study results and the project schedule	<ul style="list-style-type: none"> • Determine the process for obtaining out-of-jurisdiction registration information early in the project (e.g., once project charter is approved by the CASA Board)
Vehicles avoid the study testing locations	<ul style="list-style-type: none"> • Take potential testing site avoidance into consideration when determining the testing site locations
Stakeholder Engagement	
During stakeholder engagement, “interested parties” don’t agree with the list of management actions provided in Objective 4	<ul style="list-style-type: none"> • Try to develop the potential management actions collaboratively • If stakeholders disagree, seek to understand stakeholder reasons for disagreement • Identify non-consensus recommendations where appropriate
Lack of engagement/ownership on Project Team (incl. Human resources)	<ul style="list-style-type: none"> • Identify and communicate with potential stakeholders early in the process • Create a clear value proposition • Be clear about what is being asked of stakeholders
Obtaining stakeholder feedback and refining management actions with interested parties (Objective 4) takes longer than expected, or causes scope creep.	<ul style="list-style-type: none"> • Set specific parameters for this piece of work: <ul style="list-style-type: none"> ○ Purpose of soliciting feedback ○ Scope of influence outcomes will have on overall process • Time available

Operating Terms of Reference

An Operating Terms of Reference describes how the project team agrees to work together. The project team should discuss and reach consensus on the following items:

- Requirements for quorum
- Governance
- Meeting protocols
- Roles and expectations of project team members
- How decisions will be made
- Ground Rules
- Frequency of project team meetings
- Frequency of updates and reports to the CASA Board
- Protocols for handling media requests
- Protocols for providing updates to interested parties
- Any other considerations for working together

Stakeholder Analysis and Engagement Plan

The transportation sector is broad, and would benefit from engaging different stakeholders for different purposes. Different stakeholders could be engaged in a variety of capacities and at different times throughout the project.

The working group identified the following categories of stakeholders that may be involved:

- Project Team: Stakeholders who are required at the table to reach consensus agreement.
- Corresponding members: Stakeholders who receive all correspondence, but are not required at the table to reach consensus agreement.
- Task Groups or Technical Experts: Stakeholders who have a specific interest or expertise and can be engaged in a more focused way.
- Other:
 - Stakeholders from whom feedback on management actions is sought, which may include potential implementers or those potentially impacted (Objective 4)
 - Members of the public who may be engaged (Objective 5)

Table 4 includes a list of potential stakeholders for consideration.

Table 4: Potential Stakeholders to Consider for Involvement in the ROVER III Project

Individual or Organization	Possible Interests, Concerns, or Involvement
Provincial Regulators (e.g., Environment and Parks, Transportation, Agriculture and Forestry, Alberta Energy Regulator, Service Alberta, Alberta Justice, Alberta Health)	<ul style="list-style-type: none"> • Responsible for ensuring achievement of the CAAQS as well as provincial policy • Will likely be responsible for implementing many management actions • Interested in environmental protection and health of Albertans as well as ensuring sustainable economic prosperity • Involved in education/awareness initiatives • May be involved in implementing management actions or have interest in certain sectors, e.g., forestry trucks, shuttle buses to mine sites • May be involved for emissions testing study site access and vehicle registry data access
Federal government (e.g., Environment and Climate Change Canada, Transport Canada)	<ul style="list-style-type: none"> • Interested in ensuring achievement of the CAAQS across Canada, effectiveness of and alignment with federal policies, as well as meeting transboundary commitments
Municipalities	<ul style="list-style-type: none"> • Involved in education/awareness initiatives • Involved in site selection and permit acquisition • May be involved in implementing management actions
First Nations and Métis	<ul style="list-style-type: none"> • Interested in ensuring the health of communities • Interested in protecting the environment
Trucking companies/associations (e.g., CTA/AMTA, Independent Trucking Association)	<ul style="list-style-type: none"> • Interested in fairness across the sector • Concerns regarding possible costs or inconvenience of potential management actions

Industry	<ul style="list-style-type: none"> Interested in management actions to reduce NOx emissions that include both industrial and non-industrial emission sources
Pacific NorthWest Economic Region (PNWER) Foundation	<ul style="list-style-type: none"> Interested in awareness of requirements in each jurisdiction, for cross-border activities
Health and Environmental Non-Government Organizations	<ul style="list-style-type: none"> Interested in ensuring the health of Albertans Interested in protecting the environment
Airshed Organizations	<ul style="list-style-type: none"> Involved in education/awareness initiatives May be involved in implementing management actions
Agriculture Associations (e.g., Alberta Canola Producers, Alberta Beef Producers, etc.)	<ul style="list-style-type: none"> Interested in fairness across the sector Concerns regarding possible costs or inconvenience of potential management actions
Academia/Research Councils (e.g., U of A Centre of Smart Transportation, and others)	<ul style="list-style-type: none"> Interested in data collected and potential research implications of study results, or in possible concurrent studies

Given the different stages of this project, other stakeholders may become apparent as the work progresses. The project team will need to regularly evaluate whether the appropriate stakeholders are engaged.

Appendix A: Working Group Membership

	Role	Organization
Members		
Randy Angle	Member	Prairie Acid Rain Coalition
Andrew Barnes	Member	Alberta Motor Transport Association
Ann Baran	Member	Southern Alberta Group for the Environment
Rhonda Lee Curran	Chair	Alberta Environment and Parks
Rob Hoffman	Member	Canadian Fuels Association
Rahul Shrivastava	Member	Alberta Transportation
CASA Secretariat		
Katie Duffett	Project Manager	Clean Air Strategic Alliance
Cara McInnis	Administrative Support	Clean Air Strategic Alliance

Appendix B: Reference Materials

The project team should review the following materials in preparation for project initiation:

- *Recommendations for Non-Point Air Emissions Sources in Alberta* (CASA, 2017)
 - Final report from the CASA Non-Point Source project teams. Contains recommendations for the transportation sector in Alberta, including the recommendation for the ROVER III project.
 - Available at: <http://www.casahome.org/current-initiatives/non-point-source-project-team-37/>

- *Greater Vancouver Regional District Remote Sensing Device (RSD) Trial for Monitoring Heavy-Duty Vehicle Emissions* (Envirotest Canada, 2013)
 - A short-term study completed in British Columbia that collected emissions information for a variety of diesel vehicles and model years using a remote sensing device system and a heavy-duty emissions tunnel.
 - Available at: http://www.metrovancouver.org/services/air-quality/AirQualityPublications/2013_RSD_HDV_Study.pdf

- *The Alberta ROVER Project Summary Report* (CASA, 1999)
 - Summary report for the first ROVER project completed through CASA in 1998-1999. Includes the results from the emissions testing study and recommendations developed by the Vehicle Emissions Implementation Design Team.
 - Available at: [http://www.casahome.org/uploads/source/Alberta%20ROVER%20Project%20\(March%201999\).pdf](http://www.casahome.org/uploads/source/Alberta%20ROVER%20Project%20(March%201999).pdf)

- *The Alberta ROVER II On-Road Vehicle Emissions Survey* (CASA, 2007)
 - Summary report for the second ROVER project completed through CASA in 2006-2007. Includes the results from the emissions testing study and recommendations developed by the Vehicle Emissions Team.
 - Available at: http://www.casahome.org/uploads/source/PDF/ROVERII_Report_FINAL-8JAN2008.pdf