

Summary of Air Quality Monitoring Roundtable Discussion

February 27th, 2015



 **TORONTO** Public Health

Executive Summary - Key Outcomes

Current stationary monitors serve the purpose for which they were intended. They are well suited to examining air quality trends, evaluating very large-scale programs and regulations, and facilitating research and long term studies. They perform well when examining air quality variation between communities. Due to their sparseness, they are unable to examine variation within communities, which can be as great as that variation between communities. Additional monitoring is required to attain this level of resolution.

A range of pros and cons were noted regarding next generation monitoring. Given the potential market proliferation for these new monitors, it is anticipated that regardless of their accuracy, they will foster increased debate around air quality issues. Rather than competing against traditional monitors, a more probable use for next generation monitors would be as a complement to existing systems, potentially 'filling in the gaps'. There are however, concerns that unreliable information could affect the overall credibility of air monitoring exercises.

Monitoring must be accompanied by source appointment if we are to improve air quality. Source appointment must be precise. For example, 'transportation' might not be an appropriately precise appointment, where 'diesel trucks over 20 years old' would allow for more targeted interventions. Next generation monitors may help us to understand the impacts of site specific land-use and transportation decisions, allowing for the specific benefits of a specific project to be examined.

It is important to understand that the quest for perfect data may be an impediment to action. For many interventions, we have adequate data. For example, we know that a small fraction of diesel freight vehicles on the road are responsible for a large fraction of particulate emissions, yet effective interventions are lacking to address this. There is adequate data, but no action. We must remember that filling in the data gaps does not mean issues of air quality will be adequately addressed or resolved.

Action is deficient because this poor air quality is not a resonant political issue. Community members are not pressuring their elected officials on this topic. Community members are generally not concerned about poor air quality despite the associated social, economic and environmental costs. Broadly speaking, there has been a failing in effective public communication around the consequences of poor air quality. We need to revisit how we are communicating around this issue. Next generation monitors may help facilitate this. A clear warning coming from this Roundtable is that regardless of the adequacy or accuracy of data, without effective community engagement and political pressure, action will be stalled.

Collaboration is essential in achieving progress. Many sectors need to be effectively engaged; government, non-government, industry (emitting and non-emitting), academia, vendors, business improvement areas and, community members. Possible avenues of work for such a collaboration remain to be determined but could include; enabling citizen reporting of air quality concerns; coordinating data holdings; increasing access to information from existing monitors, standardizing protocols for the evaluation of next generation monitors; enhancing communication techniques and the development of appropriate visioning tools; ensuring that our region drives the air quality monitoring economy and is not just a consumer of it.

Detailed Summary of Discussion and Outcomes of February 27th Air Quality Monitoring Roundtable

Part 1: Some of the main questions participants felt were not adequately addressed by present air quality monitoring information and where there was hope that future air quality monitoring may be able to provide more information included:

Air Quality Variations

The discussion focused on information and understanding existing air quality monitoring provides; and the information and understanding that participants hope future air quality monitoring will provide. It was raised that variability in air quality between existing air monitors was not as well understood as would be hoped for.

- The region would benefit from a better understanding of where air pollution comes from? Where it goes? Who is vulnerable? How much better/poorer is our air quality and where is it better or poorer? How much does it actually vary within the region? The goal to have a better sense of correlation and attribution was raised.
- Transportation emissions posed a greater challenge in understanding than point sources. Transportation: Don't have data on where are the most issues. What routes are most impacting air quality? What sectors are contributing? Knowing air pollution coming from different transportation can then be put to allocating contributions from sectors, freight, commuter, etc... and identifying possible interventions that may be most able to achieve reductions.
- Bike lanes: what impact do they have on improving air quality? Where are the best places to site bike lanes? For reducing congestion, for encouraging bike traffic, for reducing air pollution, for safety, for reducing cyclist exposure? Changing modal split: what impact does that have on overall contributions and personal exposure for example?
- Land Use Policy Changes: What would be the results of implementing policy changes that reduce emissions or reduce exposure? We don't have the evidence we need at the scale we need to gather the evidence that it will be effective at reducing the health burden of air pollution and if and how it is effective.
- Baseline surrogates: What is the ability of estimating exposure from where we have data to where we don't have data? How transferable would the exposures be? Is it possible to infer exposure based on select criteria where data does not exist at present? If so what would the criteria be? Present air monitoring doesn't provide adequate understanding of the variation that would enable that type of analysis to be undertaken.
- What are the common air quality concerns and questions that exist across the region, what are the concerns and questions that are more location specific?

There seemed to be the sense that existing air monitoring in place was providing adequate information on ambient background levels but may not be adequately capturing the variation in air pollution levels, the populations most impacted and where a prioritization in actions might be most effective in reducing the health burden associated with air pollution.

- Intensification: what does it mean to exposure what are the measures that allow for intensification while understanding how it might increase exposure and how it can take place in a way that may protect from more exposure to a larger population.
- What is the exposure to very sensitive populations, for example children?
- Air quality monitoring as a means to better understand and address equity issues. Who is most exposed? Who and where is most vulnerable. It is important to prioritize interventions that improve the conditions of those impacted and those most vulnerable.

It was also raised that at present air quality monitoring was not able to provide adequate information on the results of the air quality improvements resulting from intervention actions.

- Monitoring would be very valuable in testing and gaining evidence of the impact of interventions.
- Monitor baseline levels; policy/action enacted; air quality monitored post policy/action; what difference did it make; both in terms of emissions reductions but also in public health results would be very informative information to have.
- There is a difference between old diesel vehicle standards and the new diesel vehicle standards. Use air quality monitoring to building support for Drive Clean. There are a small percentage of vehicles that are producing a high % of air pollution. Justification and evidence for retiring old trucks and moving to new trucks. Using air quality monitoring to build greater evidence for possible policies/incentives. How do we make Drive Clean work more efficiently and effectively?
- It was hoped that future air quality monitoring would be able to provide a better understanding of which interventions would have the most climate protection and air pollution reduction synergies.

Air Quality Modelling

It was highlighted that many municipalities and health units are using air quality modelling to provide them with more information related to the above issues and questions. It was recognized that modelling is very instrumental to providing information on air quality between existing monitors, however it was noted that air quality monitoring was a key component of the modelling work as monitoring served the purpose of testing and validating the air quality modelling results.

Air Pollution Source Data

It was also noted that use data related to air pollution sources was just as important as air monitoring. It enables us to have a better sense of source, distribution, and solutions. Pulling together source use and emissions data will better enable us to identify problems and identify solutions.

Communications and Engagement

Communications and engagement was also identified as an area where present air monitoring may not be able to provide the necessary level of awareness and understanding that needs to be in place in order to understand how individuals can protect themselves from personal exposure; provide adequate feedback that would provide motivation for personal emissions reductions; and build the overall public

support for the policies and actions that are required in order to achieve significant reductions in air pollution emissions.

- What exactly is a premature death? What does that mean? Can we provide the public with more accuracy on what that really means, is it days? Is it years?
- How to engage the medical community possibly using data on emergency visits? Improving the linkage between cause and effect. Air pollution's impact on respiratory and cardiovascular health. People aren't written up as dying or in the emergency room as a result of air pollution; they are written up as suffering from cardiovascular and/or respiratory illness.
- It would be great to have a better understanding of how air quality is viewed in the GTHA. What do people think about it? How do municipal elected officials see and think of air quality? What about people who come from other places with worse air pollution? More insight on this would enable us to better communicate to them about air pollution.
- How can we use social media to build awareness of air pollution? How can we use traditional media better? Smog alerts are very effective at engaging the media and therefore the public's attention.
- Air quality needs to improve on telling a narrative, creating a story. Cause, effect, impact. That would provide more meaning to the public.
- The future of air quality monitoring has significant potential to greatly increase public engagement and awareness. But making something as complicated as air pollution easy to understand will likely be a challenge.

Additional thoughts on how air quality monitoring informs our level of understanding and how we wish it could improve our level of understanding:

- It was also shared that the issues already raised at the meeting are likely just the beginning because as we learn more a whole new set of questions will be raised.
- Existing data may be able to be made more effective and increasing understanding if it was more readily available for example if data from Metrolinx, MOECC's mobile monitoring unit, and Island Airport could be made available in real time or in a more timely manner.

Part 2: New Air Quality Monitors

What are some of the pros and cons you see resulting from the new air quality monitoring technologies coming on the market? What questions and ideas emerge from the possibility of emerging air quality monitoring opportunities?

Possible Pros

- While there are differences in the accuracy of the newer less expensive air monitors it is the case that a new generation of air quality monitoring is happening. How do we make it work best towards reducing the health burden associated with air pollution?
- Progress and improvement in these monitors and their penetration into the market is only going to increase. New air quality monitors are likely to be very effective at engaging the public.

- What type of air quality information would be most useful to people? How accurate or easy does it need to be? It is possible that the need for accuracy in air quality monitoring data varies depending on what it is being used for. It is likely that a two-tiered approach would work fine. A certain level of accuracy and credibility is necessary for advocating for policy decisions and another less stringent level is required to enable people to make better decisions to change their exposure. Different types of info are needed for different purposes.
- Air quality monitoring identifying problems, solutions and results of interventions to address the problem. What worked? What didn't? That is powerful information to have.
- How new air quality monitors can change social norms and engage community challenges.

Possible Cons

- If there is a lot of data that is out there that is unreliable it could potentially reduce credibility of air pollution monitoring as a whole.
- How do we want to engage people? If we increase awareness of air quality concerns but do not provide a mechanism for air quality improvements, we are only increasing anxiety.

Questions and Ideas

- What are the requirements that are likely to be needed for the processing of the data to make it useful to people?
- Childhood data (e.g asthma rates in children) what information do we have? More importantly how can we use it better? How can we communicate it better? Cause and effect is important to help people make the connection.
- Smog days are a very effective engagement opportunity and we need to see how we can use opportunities to increase awareness of the air quality issue.
- Could mobile monitoring be made accessible to track pre and post intervention activities. For example when streets are closed or pre and post complete streets, cycling lanes, etc.
- Wouldn't it be great to have an air quality rating for vehicles, for furnaces, which are better, which are worse? Market and promote the good ones. Increase air pollutions profile.
- What is being made available as a result of monitoring during Pan Am? How could that inform our understanding of air quality variation between existing monitors?
- New air quality monitors and vulnerable populations and workplace safety? What are the opportunities? What are the risks? Don't want to just create concern and worry if there aren't a lot of improvement opportunities. How do we manage that?
- Would be good to examine what policies have been instigated through information on air monitoring in other cities.
- Learn from the tobacco experience: how do we make air pollution the new smoking issue?
- Spatial analysis is important/temporal analysis and data are important/ambient/point sources.
- How to better communicate the benefits/trade-offs. Better address mixed messages? Indoor air pollution/outdoor pollution/physical activity/ reducing personal contribution/increasing personal exposure. What are the real trade-offs? Gains? Air monitoring can help address those questions.

- How about a time when we have air monitors in all buildings just like we have smoke detectors. How can we make them easy to understand while still providing adequate information?
- Help develop the data and information we need to separate perception from reality. What are the real issues, what are the perceived issues? Where is there a gap in understanding, perception and reality?

Part 3: Value and Purpose of Collaboration

What value do you see coming out of increasing regional coordination on air quality monitoring?

- We can achieve a lot more if we work together.
- More coordination and collaboration is more likely to instill public trust.
- There is already collaboration taking place between health units across the region. The Province has been working with regional health units to further understanding of air quality across the region. Would be good to support collaboration between health units/province/academics/community and ENGO organizations/ health organizations. Our diversity of audiences, perspectives and initiatives would be a strength.
- A collaborative approach would help to better understand how we could use the air quality data to meet the needs of target audiences. How can we better communicate what we do know, what we don't know and where future air quality monitoring may be able to help answer some of those questions?
- It is important to focus both on local actions and pilots and regional collaboration. More progress will be made when actions are taken on both levels.
- Sharing perspectives on how best to make use of the data and information collected? How to make it most useful to different audiences? A diversity of perspectives and organization would likely improve our collective ability to do that.

Who should collaborate?

- May be able to learn some collaboration possibilities from INHALE Project – they work with making open data useful. It would make sense to reach out to those who have experience in analyzing big data and making it useful to the masses. Google, Cisco, work with them, or at a minimum learn from them.
- In addition to regional collaboration inter-municipal collaboration is also key, particularly between public health, planning, transportation.
- Collaboration should be broad. Should consist of outreach/sharing/working collaboratively. Coordination should include all those willing to work together on this.
- Start with those willing to work together on this now and continually reach out to others to potentially engage them.
- Identify and engage already existing networks.
- NGO community varies significantly in capacity across the region. It would be important to better identify them and integrate them.
- Industry partners.
- Environmental Liaisons in South Riverdale.

- Include community health centers they are a great community resource.
- Corporate entities, eg. consultants
- Companies looking to commercialize air quality monitors.
- Business Improvement Areas: what would be their interest in air quality? What do they think about air quality? How can we better engage them and towards what goal.
- Coordination might help to protect us from solutions that just transport the air pollution problem to another location rather than reducing the overall impact.

Possible actions for collaboration

- Citizens reporting air quality concerns. What monitoring is this based on? What is the accuracy of the monitors they have used? Collaborate on understanding the accuracy of the various monitors coming on the market.
- Collaborate on public events to get people to use and explore the monitors.
- Coordinate Use Data: traffic data; transportation data; energy use data; industrial NPRI, gas sales. Use data is just as important as air pollution monitoring. We will have a much better understanding by looking at these together rather than in isolation.
- Standardize criteria for how to test the monitors coming on the market. So that there is a common standard for testing and they can be compared more widely. Jointly contribute to testing and sharing results.
- Coordination should help to develop effective ways to make data more useful to people/citizens/policy/advocacy/engagement.
- Collaborate on envisioning and developing IT tools that better enable understanding and awareness of air pollution levels and what it means to public health.
- The creation of an air quality community coalition similar to how the food policy coalition works.
- Invest in new air monitors to test them out.
- Try and ensure that our region is part of the air quality monitoring economy and not just a consumer of it.