



Planning and Development Services

MEMORANDUM

TO: Planning and Economic Development Committee

FROM: Bryan Tuckey, Commissioner of Planning and Development Services

DATE: February 6, 2008

RE: **Ontario Professional Planners Institute (OPPI) “Healthy Communities, Sustainable Communities” Report**

The purpose of this memo is to:

- Advise Committee and Council of the recently released Ontario Professional Planner Institute (OPPI) Report , “Healthy Communities, Sustainable Communities” Report
- Highlight Regional initiatives to encourage healthy and active lifestyles
- Advise Committee and Council of other responses to the OPPI paper

In November 2007, OPPI released a report entitled, “*Healthy Communities, Sustainable Communities: The 21st Century Planning Challenge*”. The report emphasizes the interconnection between the built environment and obesity, heart disease and respiratory illnesses attributable to poor air quality. Highlighted throughout is the importance of integrating urban design, transportation and transit, land-use planning and human services planning in creating communities that promote physical activity and social cohesion.

Similar reports on this issue have been recently released from the *Heart and Stroke Foundation*, *Institute of Clinical Evaluative Services (ICES)* and St. Michael’s Hospital that respectively explore the relationship between the built environment, obesity and heart disease, and urban sprawl and diabetes.

OPPI Report: Health and Community Design

The OPPI report focuses on how the existing built environment and transportation systems affect obesity, air quality and related health issues. The report also examines the affect on human health when poverty and economic decline is factored into this relationship.

The discussion includes a number of recommendations including:

- Emphasizing physical activity such as walking, cycling and transit-use and creating more public meeting places within the built environment
- Reducing greenhouse gas emissions by “greening” the urban area with green roofs and trees, and using renewable and alternative energy sources for transit fleets
- Recognizing that public health and social cohesion in lower income areas are as important as housing, employment and education. This includes access to healthier foods and access to affordable transportation and transit.

The OPPI report also identifies the need for additional research on the connection between health and the built environment, and formulating the appropriate policies and actions.

The Heart and Stroke Foundation of Canada

Earlier this year, the *Heart and Stroke Foundation of Canada* released a Position Statement on the inter-relationship between the built environment, physical activity, heart disease and stroke. Findings indicate that over 50% of the Canadian population, 12 years and older, is not physically active. The risk of obesity can decline by 4.8% for each additional kilometre walked per day and can increase by 6% for each hour spent in the car. Recommendations to municipal governments, community planners and developers include:

- Retrofit and rezone existing communities to include sidewalks, parks and pedestrian connections to nearby schools, workplaces, shops and services.
- Create more new walkable communities that include mixed land-use and densities, a range of housing options and affordability, and good links to frequent public transit.

The Institute of Clinical Evaluative Sciences and St. Michael’s Hospital

In November 2007, the *Institute of Clinical Evaluative Sciences (ICES)* and St. Michael’s Hospital released a study that examines the role of neighbourhoods in the rising rate of diabetes in the City of Toronto. Findings include:

- Diabetes rates are highest in areas with lower incomes, higher unemployment rates and higher proportions of visible minorities and higher immigration rates.
- Areas with high rates of diabetes tend to be found in the suburban areas of Toronto where there is reduced access to healthy foods and where “activity friendliness” is lower (e.g. fewer amenities within walking distance, poorer access to public transit, greater car dependency).

Recommendations include:

- Change planning practices to reduce urban sprawl and promote density and mixed use.
- Increase access to public transit
- Provide incentives for stores selling fresh produce and other services to move into high-need areas.

York Region Initiatives to Encourage Healthy Lifestyles

York Region Sustainability Strategy “Towards a Sustainable Region”

Adopted by Council, November 2007

Action items contained in the Sustainability Strategy from a triple-bottom line perspective:

Healthy Communities:

- Integrated Growth Management Strategy, Infrastructure Master Plan and Natural Heritage System.
- Further research on the connection between community design and, obesity, and respiratory and cardiovascular diseases.
- Health awareness and programs stressing physical activity, no smoking and healthy foods.
- The 25-year Human Services Fiscal Impact Study to align with the Provincial Growth Plan.

Economic Vitality:

- Local source food strategy that increases awareness.
- Supporting the York Region Farm Fresh Initiative
- In partnership with the agricultural community, promote local agriculture to local markets, retailers, restaurants and other related businesses.
- Community gardens as a contributor to community health, social interactions and security of the local food supply.

Sustainable Natural Environment:

- York Region Climate Change Symposium.
- Corporate Clean Air Strategy.
- Transportation Demand Management program promoting alternative transportation modes.
- Solar Light Pilot Program for bus shelters and a Pilot Program to test bio-diesel fuels and diesel-electric buses for the Viva Rapid Transit fleet.
- Street tree and reforestation program.

Best Practices for New Communities: Discussion Paper

Endorsed by Council, November 2007

There are a number of references to health in different contexts within the New Communities Discussion Paper. One of the key purposes is to discuss how the Region’s new communities should be different with respect to liveability, energy, waste, transportation, health, live/work relationship. The key points that are related to health and physical activity include:

- Green buildings improve health of occupants, reduce energy demands, air-borne contaminants and greenhouse gas emissions.
- High density communities support walking and bicycling using live-work opportunities and specific street configurations, among others.
- A more integrated, diverse working urban network supporting active modes of transportation will allow for greater choice, improved health and environmental benefits.
- A system of connected recreational open spaces that foster a healthy and active lifestyle.

***Growth Management Initiative
Ongoing progress reports to Council for information***

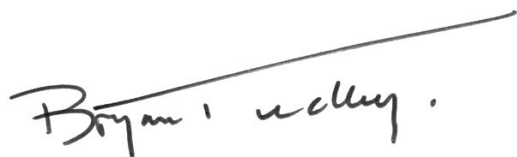
There are a number of components under the Region's Growth Management Initiative that relate directly to creating compact and transit-supportive communities, protecting and restoring natural heritage, improving air quality and promoting active lifestyles. These include:

- Residential Intensification Strategy
- Natural Heritage System Update integrated with the Infrastructure Master Plan Update
- Pedestrian and Bicycling Master Plan
- Natural Heritage Trails Concept Study

Conclusion

The OPPI report recognizes the connection between public health, land-use planning, urban design, and transportation and transit. The linkage between the built environment and the increasing rate of obesity, respiratory and cardiovascular diseases is not only Ontario specific, but is fast becoming a global phenomenon. Regional policy work, such as the Sustainability Strategy and New Communities Best Practices Discussion Paper, the Pedestrian and Bicycling Master Plan and other Growth Management Initiatives, are beginning to explore this trend. Staff will aim to further integrate the issue of health into the growth management update and the Sustainability Strategy implementation by working together with Regional departments, area municipalities and other partners.

For further information about this memo, please contact John Waller, Director of Long Range and Strategic Planning at 905-830-4444 extension 1525 or john.waller@york.ca.

A handwritten signature in dark ink, appearing to read "Bryan Waller", with a long horizontal line extending from the end of the signature.

BT / ds

Attachment: "Healthy Communities, Sustainable Communities: The 21st Century Planning Challenge", OPPI, Fall 2007

Copy to: Members of York Region Planning and Economic Development Committee

Healthy Communities

FALL 2007

Sustainable Communities

THE 21ST CENTURY PLANNING CHALLENGE

We're all familiar with the saying, "*You are what you eat.*" Perhaps it's time to add a new saying,

"You are where you live."



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Healthy Communities, Sustainable Communities

November 8, 2007

Overview

Land use planning decisions shape us in ways that we are only just beginning to appreciate – obesity, heart disease, mental health, social isolation, nutrition, and air quality. At the Ontario Professional Planners Institute's Symposium in 2006, it was clear that OPPI's members were committed to creating and fostering healthy communities throughout Ontario. In keeping with this commitment, OPPI has prepared a position paper focusing on healthy and sustainable communities with an emphasis on the importance of urban design, active transportation, and green infrastructure. This paper explores the links between public health and land use planning and includes strategies for collaborating on tangible actions that result in healthier communities.

Established in 1986, the Ontario Professional Planners Institute (OPPI) is the recognized voice of the Province's planning profession and provides vision and leadership on key planning issues. The Institute's more than 2,700 members are employed by government, private industry, agencies, and academic institutions. They work in a wide variety of fields, including urban and rural community development, urban design, environment, transportation, health and social services, housing, and economic development.

Acknowledgements

In alphabetical order, the main authors of this paper include: Melanie Horton (Natural Resources Working Group), George McKibbon (Sustainable Communities Working Group), Lesley Pavan (Environment Working Group), Nick Poulos (Transportation Working Group), and Alex Taranu and Dan Leeming (Urban Design Working Group).

The following members of the Sustainable Communities Working Group generously contributed: Allison Enns, Mimi Lau, Bob Lehman, Cynthia Rattle, and Olav Sibille. Contributions were also received from Jeff Celentano, Don May, Marty Collier, and Tony Usher.

Other Policy and Recognition Committee members contributed, including Sue Cumming (Chair, Recognition Committee), Greg Daly (Chair, Policy Committee), Melanie Hare, Dave Oikawa, William Pol, and Loretta Ryan (Manager, Policy and Communications, Ontario Professional Planners Institute).

OPPI would like to thank the many members who read earlier drafts and provided input and comment. OPPI would also like to acknowledge the contributions of members and volunteers at the District level who attended the consultation sessions held in Spring 2007.

Outside contributors and commentators include Kim Bergeron (Haliburton, Kawartha, Pine Ridge District Health Unit), Dr. Denis Corr (McMaster University), Dr. Reid Ewing (University of Maryland), Dr. Lawrence D. Frank (University of British Columbia), Dr. Brian McCarry (McMaster University), Dr. Ann McKibbon (McMaster University), Chris O'Neill (Capitol District Transportation Committee), and Gary Palumbo (URS Corporation).

OPPI would like to thank John McHugh, Edelman Canada, for his facilitation work, which greatly assisted in the drafting of this paper, and Philippa Campsie, who edited the final draft.

Thanks are offered to all for these contributions. Any errors or omissions are the responsibility of OPPI.

Why does this matter?

Where we work, live, and play is vitally important to the quality of our lives. Our built environments are not addressing emerging public health issues well, and are resulting in a less than optimum human environment. These issues are not minor, and for the first time in many decades, our children's life expectancy may not exceed our own. We need to reconsider our built environment expectations to better address emerging public health issues.

What is a sustainable community?

*"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.... In essence sustainable development is a process of change in which exploitation of resources, the direction of investments, the orientation of technological developments and institutional change are all in harmony and enhance current and future potential to meet human needs and aspirations."*¹

These principles can be applied to urban design, transportation services, and infrastructure.

Urban Design

Urban form is the physical reflection of the history, processes, economy, and social relationships of cities and regions and has two major components – built form and open space. Urban form can be studied at various scales – region, city, town, village, district, neighbourhood, centre, corridor, and nodes. Urban form influences the way we live and achieve sustainability.

Good urban form is functional, economically and environmentally sustainable, and liveable, in a way that promotes public health. It is expressed in complete, compact communities that have a clear structure of neighbourhoods, defined by centres, nodes, and multi-modal corridors. These communities offer a variety of housing options, facilities, and open space systems, including natural and built features. They are walkable, cyclable and transit-supportive, include transit-oriented development, and promote alternatives to the single occupancy vehicle. They are safe and accessible to people of all ages. They have a strong character and distinctive identity and promote a sense of place through high-quality planning and design. Good urban form, arising from careful planning and designing of our regions, cities, and neighbourhoods, has the potential to positively influence health.

Transportation Services

Transportation is the formalization of services to meet travel demands shaped by land use patterns. In most of today's neighbourhoods and communities, one mode of transportation dominates all others: the automobile.

¹ World Commission on Environment and Development, *Our Common Future* (the Brundtland Report), 1987.

Existing and planned regions, municipalities, and neighbourhoods that rely heavily upon the automobile as the primary mode of transportation are no longer sustainable. For example, travel demand forecasts in the Greater Toronto Area show that even if transit attracts 30 per cent of all a.m. and p.m. peak period travel and even if most arterial roads are widened to four or six lanes, rising automobile demand will likely extend each of the peak periods of travel to between two and three hours every day.

Further, many of Ontario's almost 13 million people do not own or have access to a car. Almost 14 per cent of the province's population is between the age of 5 and 14; many of these young people are old enough to have some travel independence, but none are old enough to drive. More than 5 per cent are over 74, an age at which many seniors may decide to limit their driving time. There are also many Ontario residents who cannot afford a car, including many low-income immigrants. Altogether, about 2.4 million Ontarians² are at a disadvantage in terms of travel, because cities and regions build roads primarily designed for the automobile. Improving access to alternative forms of transportation for all Ontarians therefore offers social as well as economic and environmental benefits.

Infrastructure

Infrastructure consists of the physical and organizational structures and processes, both natural and engineered, needed for the operation of our urban areas and transportation services. These range from water supply and sewage systems to parks and open spaces, roads and telecommunications. Infrastructure is the foundation upon which a sustainable community is built.

Infrastructure is often invisible – until it fails. Old and new infrastructure needs to be reorganized, rebuilt, replaced, or dismantled to support sustainable urban form and transportation networks if our current public health challenges are to be addressed.

What are the research priorities?

OPPI has identified five areas of public health research in which our built environments are not effectively addressing public health needs.

1) How do the built environment and transportation systems contribute to obesity and related health issues?

² John Pucher and John L. Renne, "Socioeconomics of Urban Travel: Evidence from the 2001 NHTS", *Transportation Quarterly*, vol. 57, no. 3, Summer 2003, pp. 49–77.

What we know: Studies³ show there is a statistical relationship between urban sprawl and obesity (and the public health outcomes associated with being overweight). Although the association is strong and consistent across studies, it is not necessarily a direct, causal one. Longitudinal studies suggest that when individuals move from sprawling neighbourhoods to denser, more inter-connected neighbourhoods with mixed land uses, or vice versa, they do not necessarily lose or gain weight consistent with what would otherwise be expected.⁴ In addition, confounding factors such as poverty blur the statistical relationship between sprawl and obesity related to inactivity. Moreover, it is not yet clear whether living in an environment conducive to walking increases physical activity, or whether people who enjoy physical activity tend to live in environments conducive to walking.⁵

The relationship between sprawl and obesity is also not as clear in rural or northern communities,⁶ where the land use patterns are very different from those in sprawling urban centres.

Community design is not the sole culprit in obesity. Other elements of modern lifestyles also play a role. Our technology-dependent lives, concerns about security that keep us and our children indoors and inactive, work demands that reduce the time available for active recreation – these and other trends have a great deal to do with our health and weight.

*"I'm going to argue in part that childhood obesity is because of the inability of children to walk to school. Nothing in America has gone down except the number of schools – 70% since World War II. Schools have gotten bigger and the number of kids who walk to school has decreased. In 1969 half the kids walked to school; now it is less than 15%. Because very few children walk to school, it feeds on itself because you don't want to be the one child that's out there walking."*⁷

Land use planning also affects access to fresh, healthy, and local food. The distribution of fast-food outlets in communities and along transportation corridors, and the distribution of food production systems more generally, also need to be considered.⁸ Research is growing on food deserts (areas poorly served by stores

³ For an insightful discussion, see Reid Ewing's "Can the physical environment determine physical activity levels?" *Exercise and Sport Sciences Reviews*, vol. 33, no. 2, April 2005, especially page 74-75: "There is relatively strong evidence of association between metropolitan development patterns and use of active travel modes such as walking and transit, and between neighbourhood design and active travel modes. Whether the environment is actually determining travel choices, how the environment relates to overall physical activity, and how the environment affects downstream weight and health remain issues for future research."

⁴ Reid Ewing, Ross C. Brownson, and David Berrigan, "Relationship between urban sprawl and weight of United States youth," *American Journal of Preventive Medicine*, vol. 31, no. 6, Dec. 2006, pp. 464-474; Lawrence D. Frank, Brian E. Saelens, Ken E. Powell, and James E. Chapman, "Stepping towards causation: Do built environments or neighborhood and travel preferences explain physical activity, driving and obesity?" *Social Science and Medicine*, 2007, forthcoming.

⁵ Lawrence D. Frank et al., "Stepping towards causation," *Social Science and Medicine*, 2007.

⁶ For a discussion of the elements of sprawl, see Dolores Hayden, *A Field Guide to Sprawl*, New York: W. W. Norton and Company, 2004.

⁷ Jackson, Richard, "Solving the public health crisis with smarter city planning," *The Planning Report*, February 2007, <http://www.planningreport.com/article/1223>

⁸ The Policy Guide on Community and Regional Food Planning, produced and approved by the American Planning Association (www.planning.org/policyguides/food.htm), April 2007; Wayne

that sell healthy food), the health and environmental benefits of urban agriculture, and the fate of agriculture on the fringe of urban areas⁹.

Land use context: Ewing et al.¹⁰ describe the physical elements that make up sprawl: widely dispersed, low-density residential development with rigid separations between homes, shops, and workplaces; lack of distinct thriving activity centres; and road networks associated with large block development and poor access from one place to another. U.S. researchers measure these urban and suburban elements when assessing public health.¹¹

Some of these features (e.g., the low density residential patterns) are not as prevalent in Ontario as they are in U.S. communities. Furthermore, Ontario has firm urban boundaries whereas U.S. cities have more exurban development, with middle- and upper-class residents moving to municipalities with lower taxes. Ontario residential densities tend to be higher than those examined in U.S. research, even though we are as automobile-dependent as residents of most U.S. communities.

These higher Ontario densities (and automobile dependency) also have important implications for air quality, particularly as it relates to commuting and the movement of commodities.

Application: The GTA and southern and northern urban centres.

Responses: More attention must be placed on:

- Land use patterns at regional scale that determine the arrangement of physical activities across the metropolitan area;
- Design elements applied at smaller scales that can make physical activity more inviting and less institutionalized (public parks instead of commercial gyms);
- Transportation systems that give priority to walking, cycling, and transit use and combinations of these modes, and discourage the use of automobiles.¹²

Roberts, "The Way to a City's Heart is Through its Stomach: Putting Food Security on the Urban Planning Menu," Toronto Food Policy Council, June 2001, www.toronto.ca/health/tfpc_discussion_paper.htm.

⁹ See, for example, K.E. Smoyer-Tomic, J.C. Spence, and C. Amrhein, "Food Deserts in the Prairies? Supermarket Accessibility and Neighborhood Need in Edmonton, Canada," *The Professional Geographer*, vol. 58, no. 3 (2006): 307-326; J. Smit, A. Ratta, and J. Nasr, *Urban Agriculture: Food, Jobs and Sustainable Cities*, Washington, United Nations Development Program, 1996; Michael Bunce & Jeanne Maurer, *Prospects for Agriculture in the Toronto Region: The Farmer Perspective*, Toronto: Neptis Foundation, 2005.

¹⁰ Reid Ewing, Tom Schmid, Richard Ellingsworth, Amy Zlot, and Stephen Raudenbush, "Relationship between urban sprawl and physical activity, obesity and morbidity," *American Journal of Health Promotion*, vol. 18, no. 1, September/October 2003, pp. 47-57.

¹¹ These factors are further discussed in *Understanding the Relationship between Public Health and the Built Environment*, a report prepared for the LEED-ND Core Committee, by Design, Community and Environment, Reid Ewing, Lawrence Frank and Company, Inc., and Richard Kreutzer, May 2006.

¹² Adapted from Howard Frumkin, Lawrence Frank, and Richard Jackson, *Urban Sprawl and Public Health, Designing, Planning, and Building for Healthy Communities*, Washington, D.C.: Island Press, 2004.

We need to expand our transportation legislation, policies, and modelling programs to include walking and cycling, not just automobile use, in establishing transportation master plans and infrastructure requirements. Specifically, at the local scale, attention needs to be placed on the physical design of paths and streets; safety (including lighting, street crossings, and passive surveillance); aesthetics and cleanliness; and destinations (for example, linking shopping, entertainment, workplaces, and parks).

These functional concerns have substantial implications. For example, the design of a recreational trail differs according to whether it is planned for experienced hikers, inline skaters, or cyclists, or whether it is intended to help less active users become more active. If the latter, the trail would be wider, trail signage would provide an indication of the level of effort and skill required to use the trail, the route would provide scenic views, and it would connect residential areas to shopping and other activities.

Planners also need to reconsider their role in ensuring access to appropriate healthy food, including locally grown food, for urban and rural residents.

2) *How do the built environment and transportation systems affect air quality along heavily travelled corridors and in areas of mixed uses and higher densities?*

What we know: In the United States, the federal government regulates point sources and regional airshed quality. If regional air quality targets are not met, the federal government may impose measures to require the improvement of regional air quality, including focusing transportation infrastructure funding on projects (highways) that will improve air quality, while withholding funding for projects that will impair air quality, until improved regional air quality is achieved. In order to receive funding, local and state authorities must demonstrate that the planned transportation facilities will improve air quality over the existing conditions. The federal government may require stricter management of point sources and non-point land use and transportation sources when air quality targets are not met. This may include additional requirements on industries to take ambient air quality into account when designing new facilities or implementing transportation improvements, such as the requirement to include more efficient public transit and ozone abatement measures.

Increasingly, individual states such as California are using more stringent vehicle emission standards to achieve improved transportation emissions. These standards may be an effective alternative to modelling and regulating regional airsheds.

In Canada, federal air quality standards are set under the *Canadian Environmental Protection Act*. These standards borrow from the U.S. *Environmental Protection Act* regulations and research, supplemented by Canadian research. In some instances, Canada sets lower standards than those set by the U.S. *Environmental Protection Act*. This can be a cause for concern for American communities such as Buffalo or Lake Placid in New York State, which are downwind of major Ontario coal-fired generators in Nanticoke.

Air quality standards are implemented through Ontario's *Environmental Protection Act* as regulations and guidelines that apply to point sources, most of them industrial, through certificates of approval. No comparable regulatory system exists for regional airsheds, although cooperative efforts (such as Clean Air Hamilton and transboundary studies in Windsor and Detroit) may address local and international airshed concerns.

Recent public health literature has focused on the effects of particulate matter when ingested into human respiratory systems.

Although gaseous substances are regulated through standards, Ontario has only guidelines, not standards, for particulate matter. The U.S. *Environmental Protection Act*, by comparison, uses standards to regulate particulates and Canada's federal government has declared particulate matter a toxic substance under the *Canadian Environmental Protection Act*. In this instance, Ontario's standards are lower than those set by Canada under the *Canadian Environmental Protection Act* and by the U.S. Environmental Protection Agency.

Ontario has no regulatory or policy framework to address airsheds or non-point land use and transportation emission sources such as city streets and highways, as studied by Finkelstein et al. At the same time, Ontario has mandated growth levels for each jurisdiction, which in and of themselves may result in a further deterioration in regional air quality.

Under *Municipal Act* provisions, municipalities can address dust suppression to prevent the deposition of particulates on municipal streets. New developments where dust suppression may be a concern can also be regulated through development agreements under the *Planning Act*, but these provisions are limited and have not been extended to address air quality concerns.

In some respects, progress is being made in managing air quality. For example:

- We know more about the public health risks involved with certain substances (such as the effects of particulate matter on cardiovascular systems), and can better assess the resulting land use and transportation implications;
- We have better science on the relationship between transportation emissions and a variety of medical conditions;
- We can monitor and better model mobile and local air quality in our built environment.

At the same time, local and regional air quality is deteriorating because:

- Provincial planning policies provide for much higher automobile-dependent residential densities and neighbourhoods close to major highways, arterial roads, and collector streets;
- We commute further and travel more often by automobile and move goods further and more often by truck or train than in the past.

Passenger vehicles contribute 21 per cent of nitrogen oxide (NO_x) emissions; 51% of volatile organic compounds (VOX) emissions; and 4 per cent of fine particulate matter (PM_{2.5}) emissions. These emissions take place in local traffic conditions where pollutant exposures are maximized. Recent mobile air quality research

conducted by Clean Air Hamilton suggests that particulates of PM₁₀ and larger are generally associated with industrial areas, whereas particulates of PM_{2.5} and smaller are associated with automobile, truck, and bus emissions and are distributed more widely throughout our urban areas.¹³ Increasingly, particulates are seen as a special health risk because of the way finer particles are ingested within human respiratory systems. (PM_{2.5} and smaller particulates penetrate deeper into the lungs than larger particles, causing more damage and greater health risks.)

This situation also has implications for pedestrians and cyclists using busy thoroughfares. While more physical activity is beneficial, a cyclist on a busy street may inhale enough contaminants to offset any health benefits accruing from the physical exercise. In the City of Hamilton, a design debate is under way on whether on-street cycling routes should be confined to minor thoroughfares to minimize cyclists' exposure to vehicular emissions.

Our understanding of the risks associated with air quality has evolved from that used to develop the regulatory and policy framework associated with the *Environmental Protection Act* and the Ministry of the Environment's Land Use Compatibility Guidelines. For many air contaminants, there are *no* thresholds below which we are not at risk. We experience varying health risks, no matter how low the level of exposure may be.

Another health problem related to urban form is that of urban heat islands, which are created when green spaces are replaced with asphalt and buildings. This hard infrastructure, especially roads and roofs made with black asphalt, absorbs the sun's heat rather than reflecting it back, raising surface temperatures and overall ambient temperatures. Not only does this intensify the effects of extreme heat on certain days in the summer, putting people at risk of heat-related health problems (low-income elderly persons living in non-air-conditioned units are particularly vulnerable), but it promotes the formation of smog, which exacerbates breathing problems for many people. Also, as city temperatures rise, people use more energy for air-conditioning, which translates into carbon dioxide emissions and ultimately affects climate change. **Land use context:** Particulate and gaseous emissions significantly increase the mortality rates of residents living in neighbourhoods close to major roads and highways, especially for residents with medical conditions such as asthma. Finkelstein et al.¹⁴ reached this conclusion after researching the medical conditions of residents living in neighbourhoods close to 400-series highways and major urban streets in Ontario. However, their research did not characterize these thoroughfares and neighbourhoods in land use and transportation planning terminology, making it difficult for planners to apply the research to their communities.

Mobile air quality monitoring research by Clean Air Hamilton measured very high emission levels on well-travelled City of Hamilton and Region of Halton streets. Indeed, some contaminants exceeded the capability of the measurement devices

¹³ See www.cleanair.hamilton.ca/downloads/CAHReport-2005-2006-FINAL.pdf.

¹⁴ Murray M. Finkelstein, Michael Jerrett, and Malcolm R. Spears, "Traffic air pollution and mortality rate advancement periods," *American Journal of Epidemiology*, vol. 160, no. 2, 2004, pp. 173-177.

and may exceed regulated standards and guidelines permissible for industrial point sources required under the *Environmental Protection Act*.

Both the Provincial Policy Statement 2005 and the Province of Ontario's Growth Plan for the Greater Golden Horseshoe promote growth and require higher land use densities and greater mixing of land uses within nodes and corridors, many of which include heavily travelled streets. OPPI supports these government efforts. However, although compact-growth policies have many potential environmental benefits, it is important to ensure that air quality concerns in compact areas are not overlooked.

Regulatory context: Particulate matter (PM10 and PM2.5) is addressed under provincial guidelines through the *Environmental Protection Act*, even though the federal government has declared these to be toxic substances.

While petroleum-fuelled vehicles may comply with tailpipe emission regulations, the cumulative effect of more tailpipe emissions and longer trips, together with dust generated from tire, pavement, and concrete wear, the use of brakes, and particulates re-suspended by traffic, creates an air quality problem that planners need to address.

Application: Residential neighbourhoods along heavily travelled streets and near highways.

Responses: In Ontario, the provincial government is breaking new ground, because provincial regulatory and land use compatibility policy is focused on the regulation of point sources and land use compatibility in the area immediately surrounding point sources. Ontario has no regulatory or policy framework to address airsheds and non-point land use and transportation emissions, such city streets and highways, as studied by Finkelstein et al.

Our planning response will likely include a mix of policies that include transportation management plans for larger companies and institutions and local airshed monitoring where air quality concerns are identified. Specific attention needs to be placed on reducing the use of petroleum-fuelled vehicles in favour of other transportation technologies and modes. If we are to reduce emissions, the automobile needs to be subordinate to public transportation, cycling, and walking and combinations of these forms of transportation. Greater attention needs to be placed on "greening" our urban environments with green roofs and trees, especially along heavily travelled thoroughfares. Bold policy and creative design is needed to supply the answers to this vexing issue.

Canada Mortgage and Housing Corporation (CMHC) has produced a useful model to assess the relationship between automobile greenhouse gas emissions and neighbourhood design in the Greater Toronto Area (GTA). This model can be used by planners and the public. Measures that reduce greenhouse gases also reduce the vehicular emissions of concern to public health. By reducing automobile travel time and distances, we can help reduce vehicular emissions and greenhouse gases.

Local actions such as regular road cleaning, closing certain roads to automobile traffic, elimination of idling, smoother driving habits, routing heavy trucks away from residential areas, and increased use of alternative modes of transportation are all important. Promotion of cleaner vehicles at the federal level is also required.

3) *How do the built environment and transportation systems affect air quality in general?*

What we know: Generally, air contaminants originate from three sources: trans-boundary (interprovincial or interstate) sources; urban land use and transportation sources; and industrial and institutional point sources. The percentage of each varies depending upon the location. Smog has a demonstrable effect on public health and the rate of hospitalization and mortality, depending upon the severity and duration of the period of poor air quality and associated conditions such as extreme heat.

Land use context: Point sources (such as smokestack emissions) are regulated under the *Environmental Protection Act*. Depending upon the industrial circumstances, each emission source may be regulated by a specific certificate, or all of the plant sources as well as fugitive emissions (non-point source dust emissions from raw materials storage and movement) may be regulated by a comprehensive certificate from the Ministry of the Environment. Depending upon the circumstances, other requirements may apply.

Ontario Regulation 419/05 will replace the existing regulatory framework with stricter standards for many contaminants, including the application of better computer models to emissions, a timing process under which the more stringent requirements will be applied, more attention to fugitive emissions, and ground truth emissions modelling. In addition, Regulation 419/05 provides for municipal and community involvement where the regulated standards cannot be met and alternative standards are set to address these circumstances.

The Ministry of the Environment's land use compatibility guidelines require the separation of sensitive uses from various facilities by specified distances, depending upon the classification of the industrial activity. These guidelines address circumstances in which sensitivity to air emissions below the regulated limits exists, the effectiveness of measurement and modelling is limited, and extreme weather and equipment breakdowns occur.

Regulation 419/05 will be more difficult for local health and planning officials to implement, especially where alternative standards have been developed for industrial point sources and as standards are developed for particulates. Airshed monitoring will be needed to provide a context for the modelling and health risk analyses required for applying alternative standards.

A more elaborate understanding of land use compatibility beyond that in the Ministry of the Environment's Land Use Compatibility Guidelines is required to address land use density and mixed-use policies in the Provincial Policy Statement 2005 and the Provincial Growth Plan. There is also a need for policy and regulatory

mechanisms to address municipal airsheds and non-point sources, such as major roads and highways.

Application: All land uses within specified distances from facilities with potential emissions.

Responses: Recommend the Ministry of the Environment update its land use compatibility guidelines to better address these conditions and assist in the implementation of the Provincial Policy Statement and Growth Plan as they apply to more intensive and diverse land uses. Areawide air-quality monitoring is also required, together with regulatory and policy mechanisms to enable governments at all levels to address local airsheds and non-point sources.

4) *How do the built environment and transportation systems, along with poverty and economic decline within and outside our major urban centres, affect human health?*

What we know: Poverty and community economic decline complicate the relationship between planning and public health.

The variety of pathways to homelessness indicates the complex interrelationships between poverty and public health. Homelessness is associated in various ways with mental illness; substance abuse; release from prison or discharge from a hospital or mental health facility; family crises such as physical, emotional, and sexual abuse; refugee and immigrant issues; loss of employment, especially part-time and low-paying employment; loss of benefits; lack of social and life skills; relocation from another community, province, or country; and barriers to maintaining personal safety.

From a municipal perspective, providing community services where economic activity is flat or declining and where incomes are below or close to the poverty line presents an enormous challenge.¹⁵ The needs of Aboriginal communities require special consideration.

Land use context: People on low incomes or receiving government assistance may be unable to find housing in healthy neighbourhoods. Inexpensive accommodation is often available only in areas that present air quality risks from point sources or transportation corridors. These areas may or may not be well served by public transportation and networks of formal and informal services (such as food banks, thrift shops, health facilities, retail outlets and educational institutions).

The link between land use and transportation also has implications for social equity. Across Canada, 16 to 40 per cent of household personal spending is on transportation; nearly 90 per cent of that is for personal motor vehicles. Individuals and families with lower socio-economic means and those who must drive to work (because alternative forms of transportation are not feasible) are forced to spend a disproportionate share of their income on their automobile.

¹⁵ Jim Simmons and Larry S. Bourne, "Living with population growth and decline," *Plan Canada*, vol. 47, no. 2, Summer 2007, pp. 13-21.

Ontario's plans for growth are expressed in the Provincial Policy Statement and the Growth Plan for the Greater Golden Horseshoe. But outside the GTA and major urban centres in southern Ontario, many communities face economic stagnation or decline.

Public health and air quality considerations represent a lower priority in these areas than sheer economic survival. Planners need to address the issues of stagnation and decline as well as growth in dealing with public health issues.

Application: Low-income neighbourhoods and economically stagnant communities, as well as many rural and northern communities outside the GTA.

Responses: In areas of decline, planners need to focus on primary public health, housing, and employment, as well as strategies for education and assistance to relocate. Social planners have a role to play in creating and maintaining appropriate human services in such areas. Local employment opportunities may also be created through economic development and the maintenance of servicing levels. Youngstown Ohio's "2010, Sharing the Vision for a Better Tomorrow" is an example of creative municipal planning for decline.¹⁶

5) *How do the built environment and transportation systems affect social cohesion?*

What we know: Social cohesion is defined "*as a feeling of belonging and that community member needs will be met, as the series of social networks that inspire trust and reciprocity among citizens, as a psychological sense of community, and as civil society or the work of voluntary and purposeful organizations distinct from government where citizens draw together to socialize youth, take care of the sick, promote cultural and political life and forward their social and individual needs.*"¹⁷

The benefits associated with social cohesion are significant and their links to the built environment and transportation systems are increasing the focus of research. "Road rage" is an extreme instance of the breakdown in social cohesion related to modern lifestyles and long commutes, but this breakdown can also take more subtle forms. Research has found that the proportion of residents who drive to and from work is significantly and negatively related to the number of neighbourhood social ties.¹⁸

Conversely, social cohesion is promoted by a diverse community designed for increased walkability, with significant accessible and central public spaces and at a scale which promotes interaction. The contribution of mixed uses and higher densities is less clear.

¹⁶ See <http://youngstown2010.com/plan/plan.htm>.

¹⁷ Design, Community and Environment et al., *Understanding the Relationship between Public Health and the Built Environment*, A Report prepared for the LEED-ND Core Committee, May 2006, p. 89.

¹⁸ Lance Freeman, "The effects of Sprawl on Neighbourhood Social Ties" in the American Planning Association Journal, Winter 2001, Volume 67 Number 1.

Land use context: Most current development is car-oriented. We need to design new communities and redesign older communities to support a balanced array of transportation services, especially public transit, walking and cycling. However, consistent progress towards balanced transportation systems has been slow at all levels. It is evident that:

- Although individual municipalities have implemented public transit, medium-to long-distance transit options are relatively scarce.
- Major roads are congested, which affects the efficiency of bus transit.
- Capital funds are insufficient to implement balanced transportation services, particularly transit, and new revenue sources are not yet being made available to solve transportation problems.

Application: All communities in Ontario.

Responses: Planning must support bold decision making that enables local communities to take ownership of and manage change sustainably. Planning for social services should also promote social cohesion, rather than stigmatize those who require the support of such services. Land use and transportation measures that provide for diverse, walkable communities with accessible public activity centres built to human scale will help support social cohesion and address public health issues associated with obesity, air quality, and economic decline.

Where do we go from here?

A recent workshop on urban sprawl and public health, convened by the Association of Local Public Health Agencies, highlighted two important issues.

- 1) Much of the public health research is U.S.-based. Ontario public health professionals emphasized we need Ontario-based research. Moreover, American public health research tends to measure sprawl in a way that is not applicable in Ontario.
- 2) U.S. and Ontario planning frameworks are quite different. Ontario's planning system is policy-driven, whether at the provincial or municipal level, and focused on land use.¹⁹ U.S. planning systems (and their planners) are driven more by research and standards with a wider focus than land use alone. Unless we take into account these unique differences, we may not be able to design an appropriate Ontario response to important public health issues.

OPPI recommends that this paper be circulated to the Association of Local Public Health Agencies and others, to obtain comments from public health professionals already engaged in planning efforts to address these topics. We can learn from this interaction, and prepare a more comprehensive position paper to inform and engage OPPI membership.

Research and discussions should be organized around the themes of urban design, transportation, and infrastructure, including social infrastructure.

¹⁹ Norman Pearson spoke at this conference and identified the *Planning Act* revisions of the 1980s following the Comay Report as having broken a previous link between public health and municipal planning with amendments that focused solely on land use.

Urban Design: Provincial policies support more intense, sustainable, and healthy communities, but development remains mostly car-oriented and the market continues to favour conventional development styles.

The persistence of conventional standards, the inertia of the planning and legislative systems, reliance on well-established marketing mechanisms, a lack of interest at all levels of government, and the need for public education on the benefits of sustainable communities make it difficult to switch to healthier types of development.²⁰

Transportation: every level of government must:

- Contribute funds and resources towards the implementation and operation of connected transit networks that can reduce travel times and provide consistent levels of service with appropriate fare structures; and
- Create new policies, standards, and criteria to treat transportation as a resource, the primary purpose of which is to provide healthy corridors in which all modes of transportation are treated equally.

It is no longer appropriate to focus solely on automobile demands and assume that transportation corridors can continue to be widened by adding lanes of private vehicle traffic. Transportation models must give greater weight and attention to balancing the demands of cars and trucks with those of public transit, cycling, and walking.

Neighbourhoods and communities must:

- Create an environment in which public transit, walking and bicycling become the predominant mode of transportation for people to get to school, work, recreational facilities, and convenience shopping;
- Offer live/work opportunities where residents can either work at home or walk to work;
- Implement Internet access strategies to help employees work from home; and
- Implement Travel Demand Management programs among large corporate and institutional employers, and promote these programs when new residents move in or new employees are hired.

Neighbourhood and community planning must structure an environment that reduces the need to travel outside the community during the daily peak period travel times. Active Travel Demand Management Strategies should become a part of the planning approval process.

Infrastructure: Much of our existing infrastructure supports automobile usage and is aging, requiring expensive maintenance or replacement. At the same time, infrastructure expansion and replacement will place additional stresses upon resources (the pits and quarries that provide aggregate for road construction and

²⁰ Peter Calthorpe's pioneering work on transit-oriented development is said to have originated in field work conducted in Toronto 20 years ago, but Ontario is no longer at the forefront of innovation in this area. Peter Calthorpe and William Fulton, *The Regional City, Planning for the End of Urban Sprawl*, Washington, D.C.: Island Press, 2001; Peter Calthorpe, *The Next American Metropolis: Ecology, Community and the American Dream*, Princeton: Princeton Architectural Press, 1993.

concrete for building, and the forests that provide construction materials). Recycling used construction materials to reduce these demands for fresh resources will require additional spaces within urban areas for reprocessing materials for reuse and may generate additional dust and particulate emission sources. Road, infrastructure and building design standards may also need to be revised to enable greater reuse of construction material.

What can we do?

As individuals, we should all try to lead a more active life, by taking 30 minutes at least five days a week to walk, cycle, or exercise. We can educate ourselves as to how to reduce our car dependence by reading books such as *Cutting Your Car Use* or *Divorce Your Car!* We can calculate our environmental footprint by going to www.myfootprint.org and following the suggestions for reducing that footprint.

As community members, we can evaluate our neighbourhood's sustainability from a greenhouse gas perspective by using CMHC's tool (www.cmhc.ca/od/?pid=62424) to assess the community's land use and transportation infrastructure. Then we need to become active in local decision making to improve the neighbourhood's sustainability.

Those employed in municipalities or public agencies can work with public health professionals to address these public health challenges in designing, retrofitting or, where necessary, dismantling parts of our built environment to make our communities more sustainable. They must also educate the public as to why we must make significant changes to reach sustainability.

Urban design: Designing complete, mixed-use communities with good access to employment, shopping, education, recreational opportunities, and health care will help reduce car trips and promote a healthier, more active lifestyle.

Designing comprehensive open space systems that integrate and link natural features could help alleviate respiratory problems, promote physical activities, and support mental health. A hierarchy of good-quality built features (urban parks and parkettes, squares, and pathways), linked with well-designed walkable streets would also contribute to healthier communities.

The greening of our cities and neighbourhoods (existing or new) is another way to make communities healthier. We can make the urban infrastructure less visible and remind ourselves of our connection to the natural environment by planting trees along streets, particularly the most travelled ones; reducing the extent of paved areas, particularly surface parking; installing permeable paving and green roofs; and making creative use of stormwater features. Building techniques such as triple glazing, careful placement of outdoor amenity areas, and tree planting along heavily travelled streets could mitigate the negative effects of traffic on communities.

Transportation services: Highways and large arterial roads, in combination with the automobiles that use them, are a source of air and noise pollution, air and water contaminants, and accidents. Planning communities with high connectivity

and spreading the traffic and transit along the main streets must be combined with appropriate distribution and placement of supportive built form.

Reducing the number of private vehicle lanes, adding dedicated transit lanes, allowing space for intensively planted boulevards and medians, and promoting transit and walkability will help reduce pollution and accidents. Accidents could be reduced and safety increased by slowing the posted speed of roads.

Work must begin at every level of government and every level of planning and design. For example:

- Every Secondary Plan and Plan of Subdivision should ensure that communities satisfactorily accommodate all primary modes of transportation and do so in a convenient manner that directly connects and relates to its surroundings;
- Arterial roads should contain no more than two or four private vehicle lanes; if additional travel demands exist, the additional corridor space should be devoted to transit or bicycle lanes;
- Comprehensive Travel Demand Management strategies that provide incentives and disincentives should be in place, recognizing all modes of transportation;
- New standards and approaches to managing transportation resources should be introduced in concert with land use plans.

Clustering industries and health care facilities can allow organizations that are linked in some functional way to share transportation services and infrastructure.²¹ We need to build such considerations into public transit, cycling and walking infrastructure, and to support emerging industrial and institutional land use transportation demand management.

Infrastructure: We need an openness to new ways to design, develop, and implement new infrastructure that support the changes to urban form and transportation systems described above. Planning for social infrastructure can also support healthier lifestyles, particularly among low-income households.

Where do we have more work to do?

We face the following immediate priorities:

- 1) Refine and verify the results of the public health work on the relationship between sprawl and poor health outcomes (including obesity) within an Ontario context to better develop land use and transportation design responses to Ontario's unique built environment.
- 2) Develop design measures and transportation modelling methods to balance walking, cycling, and public transit better with the demands of automobiles.
- 3) Prepare more sensitive land use compatibility guidelines to address noise and air contaminants associated with the mixed land uses and higher densities required by Ontario's growth management policies.

²¹ Bjorn Asheim, Philip Cooke, Ron Martin, eds., *Clusters and Regional Development: Critical Reflections and Explorations*, New York and London: Routledge, 2006.

- 4) Develop planning policies and methods appropriate to different contexts; in economically declining regions and municipalities these policies may include encouraging markets for locally grown agricultural produce, finding innovative local uses for lands and resources in rural and northern communities, and scaling services in declining rural and urban communities to match community needs.
- 5) Ensure that planning analysis and decisions enable local communities to take control and manage change sustainably.

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