

20/20 Sustainability Movement in Ottawa: Focus on Quickway Bus Rapid Transit

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Ottawa, ranked the third cleanest city in the world with the fourteenth highest quality of life, can be considered one of the world leaders in terms of sustainability and its impact on quality of life (Mercer 2010). Even as the fourth largest city in Canada, the nation's capital only has a population of 859,704. With a large focus on government operations and high-tech industry, Ottawa has the ideal foundations to be an innovative model for other cities. Recently, Ottawa has become an unsung leader of sustainability issues, especially in the area of transportation, as evidenced by its state-of-the-art light rail transit system.

In the past decade, the city has made a major push for creating detailed and viable sustainability goals. In the early 2000s, the city began work on the Ottawa 20/20 plan, a comprehensive view of the environmental, economic and social changes the city wanted to see by the year 2020. The plan offers strong metrics based on the current situation, future goals, and dates for progress reports. The city has created many sub-plans in various areas of the 20/20 plan in order to offer not only a comprehensive but also a detailed and plausible solution to the many sustainability issues it faces.

In this paper, the sustainability movement in Ottawa will be assessed, with a large focus on the development of the 20/20 Sustainability Plan. In the first part of the paper, various areas of the plan will be evaluated in terms of success and future feasibility, which includes transportation, greenspaces, waste management, environmental strategies, food, and green

businesses. Both the strengths and weaknesses of the plan will be outlined along with the overall effectiveness of the plan. In the second part, one aspect of sustainability will be analyzed in depth, similar to a case study. In Ottawa, the “best practice,” or most innovative practice, is the Quickway bus rapid transit system. Finally, to analyze the potential impacts of Ottawa’s sustainability plan, its plausibility and portability will be discussed.

Ottawa 20/20

Ottawa 20/20 is an innovative approach to city development that outlines a vision of the city in the year 2020. As the nation’s capital, Ottawa aims to become a leader in creating innovative solutions to social, economic, and environmental issues. Beginning with a “Smart Growth Summit” in 2001, plans for a more sustainable city have grown into a comprehensive and detailed plan. Ottawa 20/20 is complemented by “supporting plans,” which are more detailed reports on strategies for each area of sustainability. This unique combination of a comprehensive master plan and extremely detailed supporting plans inspires feasibility and plausibility. However, it is vital to consult not only official documents, but also local organizations, magazines, and newspapers when evaluating the strengths and weaknesses of the plan.

Ottawa’s existing greenspace network, along with its plans to increase accessibility, affordability, and expansion, make it a world leader in green-space policy. Ottawa is famous for a “legacy of visionary community builders” who have installed scenic parkways, a greenbelt, and green corridors constructed along rivers and waterways (Greenspace Master Plan 2006). The city has gone through a huge movement to connect these areas, known as the Urban Greenspace Network. Multi-use pathways and green corridors seem to be the most plausible methods to achieving a connected series of green spaces. However, with a rapidly growing

population, Ottawa's greenspaces face increased pressures as the 2020 deadline approaches. As a result, the city has already enacted a target of 4.0 hectares of a greenspace per 1000 residents (Greenspace Master Plan 2006). Furthermore, the city already has a target to have all homes be within 400 meters of a green space. More detailed reports suggest that it is feasible to increase the goal to within 250 meters by the year 2020 (Greenspace Master Plan 2006). A potential focus for the city is using recreation as a key for ecological protection (Erickson 2003). If the citizens are more likely to use the green spaces, then it becomes easier for the city to preserve them from urban expansion. Even though pressures are beginning to mount, especially to establish more spaces and organize funding for future projects, the city seems to be in good shape to handle them. With an already strong basis of the green corridors, parkways, and multi-use pathways that make up the Urban Greenspace Network, Ottawa has a detailed and feasible plan to implement new greenspaces and monitor current ones. The Greenspace Master Plan, a sub-plan of Ottawa 20/20, has strong metrics concerning the affordability, accessibility, and expansion of the Greenspace Network, strengthening Ottawa's position as a world leader in greenspace initiatives.

Although Ottawa has never had transportation problems that rival some of North America's other large cities, it has nevertheless become a leader in creating a sustainable network of transportation in the city through cycling, pedestrian, bus rapid transit, and light-rail systems. Part of Ottawa's Transportation Master Plan involves the increased use of cycling and walking as means of transport. The city is focusing on creating well connected, safe, and aesthetically pleasing trails practical for both leisure and utilitarian cycling and pedestrian trips. However, the city recognizes that cycling and pedestrian plans will not solve the transit problems the city is facing. As a result, Ottawa is already a leader in bus rapid transit (BRT), specializing in promoting BRT over a long-range use plan due to its greenspace policies. Ottawa

has already served as a model city for cities such as Brisbane, Australia, as it already has a developed BRT system known as Transitways. These, according to the US Department of Transit, have resulted in Ottawa having the “highest per-capita transit mode share of any mid-sized city in Canada or the US” (United States Department of Transportation 2008). Even so, the city plans to add 42 more kilometers of Transitway lines and 58 new BRT stations (Transportation Master Plan 2003). Even with a pioneer BRT system, the city is making progress in establishing a new, more effective light rail transit (LRT) system. Even though the O-Train already exists and operates, the city believes that it could become as effective as BRT systems without the same amount of carbon emissions. On October 21, 2011, the city finalized the selection of three companies for the new LRT projects. The final proposal will be selected within the next year, and by 2013 construction of LRT should begin (EMC News 2011). The implantation of a LRT system is expected to generate \$3 billion of economic activity, along with providing 20,000 “person-years” of employment for construction alone. The LRT system, when completed, could turn out to be the “best and most cost effective solution to the city’s long term transit needs” (EMC News 2011). This means that in the near future, Ottawa may not only be a pioneer in BRT, but also in LRT. Considering the fact that Ottawa is already a leader in bus rapid transit and has already served as a model for other cities, it may become an even greater model of sustainable transpiration with its implementation of LRT.

Ottawa’s sustainability plan has made considerable progress in recycling and waste reduction; however, new technologies from a private company have the potential to turn Ottawa into one of the most efficient waste processing cities in the world. Currently, the city operates on a bi-weekly collection of blue and black boxes, which help to distinguish between different types of recyclable goods. Probably the most important reason for Ottawa’s largely successful recycling programme is citizen participation in sorting and recycling their wastes.

Furthermore, Ottawa is one of few municipalities to recycle all types of plastic (#1-#7), while many municipalities only recycle #1 and #2 plastics (Integrated Waste Management Master Plan 2003a). Ottawa's most innovative goal for waste management, however, comes from the private Canadian company Plasco Energy Group. This company aims to turn garbage into both electricity and construction aggregate while creating minimal toxic emissions (Ames 2009). In order to convert municipal solid waste into these products, the waste is gasified and then refined to plasma to become inert gases or inert slag pellets (Ames 2009). Plasco Energy Group creates the "highest energy yield of any waste conversion technology presently being used on a commercial scale while keeping harmful emissions at or below the toughest environmental standards in the world" (Ames 2009). Even though this is a private company, the government issued a \$9.5 million grant for the development of the research (Plasco Energy Group 2010). The strategies may not be part of official city policy, but there is no doubt that the city is supporting this new technology that has the potential to produce ground-breaking changes in the area of waste management.

The city of Ottawa's official plans include an Environmental Strategy Plan that addresses key issues such as health, air quality, and water quality. The Environmental Strategy Plan encompasses some of the plans already discussed, such as the Greenspace Master Plan and Integrated Waste Management Master Plan. However, aside from these areas, the city is trying to reduce pollution and environmental degradation by monitoring ground water, air quality, climate change, and forestry. The city is focusing on maintaining and preserving water flows and using these water sources without resulting in water pollution. The forestry plan ties in very closely to the Greenspace Master Plan outlined above; the city has so far been successful in maintaining its connection with nature, which includes forests. Air quality and climate change issues related to three major areas: transportation, waste management, and buildings. The main

goals are to reduce energy consumption and to consequently lead to fewer greenhouse emissions and toxic chemicals. All of these goals also relate to human health, because they attempt to decrease the number of environmental illnesses, such as respiratory problems from emissions or acid rain. Many of the city's goals concerning environmental strategy have been previously outlined in waste, greenspace, and transportation sections of this paper. However, it is necessary to outline the beneficial effects of these policies in greater detail (e.g. health concerns) to further evaluate the successes of the city's official plan towards creating a sustainable Ottawa (Environmental Strategy for the City of Ottawa 2003-2008).

Ottawa's official plan offers a comprehensive view of urban design through the City's Design Objectives, which are particularly strong in the implementation of mixed-use buildings, maintaining cultural heritage, and preserving man's connection with nature. With respect to preserving nature in the city, much of the work is intertwined with the design objectives of the Greenspace Initiative. However, a new goal within the design objectives is to maintain cultural heritage, considering that Ottawa is the capital of the nation. This is headed under the fourth design objective, to "Respect Established Character." One of the main goals is to preserve community landmarks, such as Laurier Bridge. The city aims to continue development "with sensitivity as to not overpower or detract" from these historic monuments. Ottawa's design objectives also aim to preserve local architecture and public art. The city's overall goal is to increase a sense of community belonging and increase standards of living by sustaining the local heritage and culture of the city. The second, and perhaps most important design objective to be discussed, is titled: "Incorporate Adaptability and Diversity." The most innovative of these plans is the implementation of mixed-use buildings, such as those found along Sparks Street or the Byward Market. Constructed as a mix of residential, commercial, and civic uses, these buildings are very successful in Canada. The public has been very open to the installation of mixed-use

buildings, which fulfills a dual-goal of creating vibrant, livable communities and reducing urban sprawl. The combination of successful urban planning by the city and the reception by the citizens have made Ottawa's mixed-use buildings, and thus its urban design objectives, very successful (The City's Design Objectives 2011).

Ottawa's experiments and planned use of solar energy have started to make it a quiet leader in renewable energy. As recently as January 7, 2011, the city has convened to discuss progress on solar energy in Ottawa. The report revealed that the original MicroFIT programme, which provided solar energy to a few households, resulted in "long-term price guarantees." (Schepers 2011). The city also recognized that the preference for solar panels has been growing based on research on similar mid-sized cities in Ontario that invested in solar panels. The city concluded that investment from the government, such as through various cities' hydro companies, was preferable to direct ownership because it did not incur "direct capital investment." (Schepers 2011). A presentation by the Sustainable Eastern Ontario energy network analyzed and summarized the most important parts of the city's solar efforts. Existing solar initiatives within the city include solar energy parks and solar rooftop pilots. The pilots have proved to be so successful that the city has developed a partnership with Energy Ottawa (20-year lease) to develop solar arrays (Sustainable Eastern Ontario 2011). Over the 20-year lease, it is estimated that Energy Ottawa will make between \$4-5 million in profits, thus providing incentive for the company to encourage renewable solar energy usage across the city (Sustainable Eastern Ontario 2011). Other potential benefits include increased financial stability due to new revenue flows, reduction of greenhouse gas emissions, and a shift away from other sources of non-renewable energy. Ottawa also has the potential for increased energy security because they would not be dependent on coal or oil from foreign sources. However, the plan is still underway, with the first solar arrays to be installed in 2012. From there, the programme

could continue to grow and continue to strengthen Ottawa's position as a leader in renewable energy technologies in Ontario, and potentially in the near future, in all of North America.

Amidst the wide range of strengths in the Ottawa 20/20 plan, food initiatives are noticeably lacking. The city does not have any significant plans in the area of food sustainability. However, this may be due to the fact that many local organizations have already created their own policies concerning food issues. There is not a pressing need for the city to include many plans because of grassroots and local organizations. Farmers markets have been organized by local organizations and are very popular in Ottawa, without needing much government incentive or endorsement. Perhaps the only significant mandate coming from the City of Ottawa is the Savour Ottawa "seal of approval" (Wagman 2011). This seal indicates products that are locally grown and produced and helps them stand out to consumers in specialty food stores. However, the success of farmer markets should be credited more towards local organizations than the city office. The farmer markets are also helping to spur another non-governmental movement: the Ottawa-Gatineau Slow Food Movement (Hall). In a brief description, the Slow Food Movement attempts to counteract the consumption of fast food by encouraging citizens to eat local, such as from farmers markets. Even though it is a relatively new movement, it is slowly becoming more popular in the Ottawa and Gatineau regions. From the information presented above, it is evident that sustainable food policies are carried out largely by local and other non-governmental organizations. However, when help is needed, the government has offered support, such as through the Savour of Ottawa seal of approval. In reality, what is a weakness in Ottawa's 20/20 sustainability plan is actually a strength in terms of localist movements.

Another major deficiency in the 20/20 plan is a lack of initiatives on green businesses. Even though there are some policies that encourage the construction of reusable buildings and the greening of buildings (e.g. green roofs), the plan does not promote sustainable business

practices. Maybe this is also a byproduct of the fact that much of Ottawa is comprised of government operations, many of which have already undergone attempts to become greener (e.g. the use of solar panels on City Hall). However, it cannot be ignored that the 20/20 plan focuses solely on social justice issues, such as encouraging the growth of small, local business. Ottawa definitely has a strong community of small local businesses, especially since it is dominated by government buildings and has high immigration rates, so there is a need to develop this aspect of the city's green plan (A Window on Ottawa 20/20 2003c).

Best Practice

As outlined above, Ottawa 20/20 has strong metrics to continue developing and carrying out innovative sustainability plans. Of these plans, some that stand out are Ottawa's greenspace network, development of the transportation industry, and research into waste management techniques. However, if one practice had to be chosen as a "best practice" in terms of current execution, success, and originality, it would be the Bus Rapid Transit (BRT) system in Ottawa.

Ottawa's Transitway system has resulted in the highest per capita transit use, by a large margin, of any mid-sized city in North America. In fact, Ottawa has been a pioneer in the BRT industry and has created an innovative system of bus transit. A US Department of Transportation report even went as far as to say that Ottawa has "not copied from other cities, but evolved out of Ottawa's need to achieve certain targets and goals." The Transitway system in Ottawa, known as Quickway, has grown out of demands and responses to public sentiment, dating back to public sentiment against road expansion that occurred in the late 1970s. In response, the city began to pass policies favouring public transportation and soon began a heavy focus on the BRT system. In creating a unique and personalized transit system, Ottawa is not

only a leader in sustainable transportation but also continues to strive to incorporate even more sustainable methods of transportation (United States Department of Transportation 2008).

One of the unique parts of Ottawa's Quickway transit system is its organization and prioritization of bus transit. Grade separation is key to Ottawa's bus transit, which creates right-of-way priority for bus transit. Even though there are somewhat inhibitive start up costs before reaching more cost-efficient grade-separated lanes, the gradual development of transit lanes in Ottawa has enabled the city to overcome cost restraints. An important feature of Ottawa's BRT is that buses move through stoplights by means of timed light intervals and bus sensors. One noticeable divergence from grade separation is that transit lanes do not exist in downtown in order to reduce costs. Instead, other priority methods such as controlling stoplights are crucial for downtown. As a result, BRT is a convenient method of transportation that has allowed the city to have the highest per capita transit use in similar sized North American cities (United States Department of Transportation 2008).

Another important feature of Ottawa's transit system is the BRT stations. The stations are located at one-mile intervals, which drastically improves the convenience of taking the bus. Furthermore, the stations have enclosures in order to withstand harsh winters and not to deter passengers for travelling on even the coldest of days. The stations are also all made of common design in order to prevent citizens from not using certain stations based on design. Perhaps most importantly in the implementation of stations has been government supports; there has been "strong political support for high quality stations." BRT stations highlight Ottawa's strength in not only a more cost-effective and sustainable transit system, but also in making transit more practical, convenient, and comfortable (United States Department of Transportation 2008).

The use of BRT vehicles also demonstrates Ottawa as an innovative leader in BRT. There are no special vehicles for BRT; instead, the Transitway was itself designed to permit more

efficient use of the fleet already in existence. Instead of upgrading to greener running buses, Ottawa has been considerable progress in making transport more sustainable by adapting the Transitway to sustain current buses. One new addition has been the addition of low-floor buses, which are not used to replace old vehicles but are now being purchased as the fleet grows. Due to the fact that these vehicles still do not have any special markings, Ottawa has successfully discouraged vehicle branding. By doing this, the city attempts to maintain a socio-economic equity that exists with current users of BRT. By addressing both infrastructural, environmental (greening), and social issues in the use of buses, it is apparent that Ottawa is by far a leader in sustainable transportation (United States Department of Transportation 2008).

With the combination of innovative transit lanes, stations, and vehicle control, the city's personalized Transitway plan, called the Quickway model, is an innovative and ideal set-up of a BRT system. As mentioned before, one of the most innovative transportation plans is Ottawa's successful implementation of a grade-separated network. This provides greater access to an increasing number of residential zones, a decrease in travel times for passengers, and the ability to target key destinations. Being the birthplace of the Quickway model, Ottawa has also developed some unique Quickway-specific plans, such as express branching and right-of-way policies. Furthermore, Ottawa has even begun to incorporate light-rail principles, such as a service spine, into its BRT initiatives. This unique combination of initiatives and goals has turned the Quickway into a revolutionary transit design, one that has already been copied around the world in cities such as Brisbane, Australia. According once again to the US Department of Transportation, Ottawa's "combination of fixed infrastructure but variable service plan has been identified as one of the major strengths of Ottawa's approach." The design of Ottawa's transit lines and bus priority systems, or fixed infrastructure, has resulted in the service being of very high quality, potentially the best in the world. Ottawa is already first in North America in transit

mode split, eclipsing such sustainable powerhouses as Calgary and Vancouver. The result of Ottawa's Quickway system is upwards of 200,000 trips per day, an impressive number considering Ottawa's population is only just above 800,000 (and spikes to about 1.2 million when including all surrounding areas). The Quickway infrastructure and service are sustainable not only in terms of maintaining an effective transportation industry but in creating a massive increase in public transport. The Quickway system is an innovative design that has pushed Ottawa to the top of the ranks in sustainable transportation systems (United States Department of Transportation 2008).

With the Quickway system proving to be very successful in increasing public transit, the public had one issue: safety. Worried about the risk of crime at bus stations or even on the buses themselves, some citizens were scared to take the bus into the night hours or in less-safe neighbourhoods (which in turn had the potential to create a socio-economic disparity on the buses). In response, OC Transpo (the City of Ottawa's transportation body), installed 450 camera and surveillance systems at buses stations and on the buses. Furthermore, safe areas were made at boarding sites in stations. Buses are also equipped with emergency lines that alert the driver and give the driver a possibility to prevent the crime or call the police immediately. The city, with an already impressive programme, responded swiftly to the minor safety concerns. This goes to show how important BRT is in Ottawa and how much the city is willing to invest to make itself a leader in sustainable transportation (Hurley 2011).

As can be seen in the analysis of Ottawa's transit lines, the Quickway is one of the most innovative transportation systems in the world. Its accessibility, usability, and practicality have all made public transportation extremely attractive in the city and has thus resulted in one of the highest per capita transit rates in the world, approaching even those of European cities. The high rates of public transportation usage in Ottawa have placed a new standard on sustainable

transportation for North American cities. Considering that the city is already a model for other cities, it is still making its own improvements. The Transportation Master Plan from 2003 proposed \$53 million to be spent on BRT alone as part of the 20/20 Plan. Furthermore, it announced seven new corridor projects, many of which have already been completed. Even as a leader in sustainable transport, Ottawa continues to raise its own standards for improving its innovative BRT system (Transportation Master Plan 2003b).

Even though the Quickway is a state-of-the-art transportation system, it is possible that it may not be practical for all cities. The Quickway offers a much denser web of services than most cities, and it may have pushed transit service over a “tipping point” that many cities will not even be able to reach. Even Brisbane, which has experienced success in copying the Quickway system, is much less efficient than Ottawa in encouraging public transit. In the United States, there exists a huge barrier to this innovative transit technology: cost. Grade-separation, a key component of Quickway, has the potential to be more cost-effective in the long run but also has higher up-front costs. It has already proven to be an obstacle for some US cities and may be completely idealistic without the immense city and public support found in Ottawa (along with many places in Canada). This could also contribute to a lack of knowledge regarding the Quickway system. Looking at a combination of both reasons reveals that the state-of-the-art BRT system in Ottawa may be innovative, but may not be portable to all cities (United States Department of Transportation 2008).

Conclusion

Ottawa’s sustainability initiatives currently rank as some of the most feasible and innovative plans in the world. Recent developments in the areas of transport, waste management, greenspace networking, urban design, renewable energy, and environmental

strategy are beginning to turn Ottawa into a leader in green practices. Some of the most promising policies in the city include the large investment in solar energy, implementation of mixed-use buildings, and the development of the light-rail OTrain. However, the city's most innovative plan is the development of the Quickway bus rapid transit system. Even though Ottawa is strong in many areas of sustainability, its plan does not include many innovative ideas on local food, and there are significant improvements in general to be made in the areas of green jobs and businesses.

Even though Ottawa has the potential to serve as a model for other cities in many areas of sustainability, many of its policies may not be plausible in other cities. Part of what makes the sustainability movement so successful in Ottawa is government participation and a very liberal view on sustainability policies. This has allowed for many innovative changes, such as government financing and citizen participation in the implementation of solar energy. Furthermore, Ottawa is also a relatively small city with a unique landscape, making the implementation of policies easier and more feasible. For example, creating a network of green spaces may be difficult in city's that do not have an already strong balance between nature and urbanization. Ottawa could serve as a model city for waste management and environmental strategy, but many of its urban design, renewable energy, green-space, and transportation policies may not be portable to other cities. Aside from merely serving as a leader in sustainability policies, Ottawa also has the potential to bring in other successful sustainability plans in areas that need improvement, because of huge public support and government investment. Due to Ottawa's innovative sustainability plans and possibility for potential growth, it should continue to be a global leader in sustainability for years to come.

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