Electrifying public transportation: A comparison of Québec, Ontario and California

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The purpose of this paper is to compare the projects and public policies of the Canadian provinces of Québec, Ontario as well as the State of California in regards to the electrification of their mass transit systems. These three provinces/states have developed over the last decades policies and projects that aim at the electrification of their mass transit systems. However, while some projects have been a success, others have been a mitigated success, such as the Bi-Mode locomotives for Montreal's commuter rail network, or even the failure of various projects. The paper is structured in the following way. 1. A short definition of Public Policy, 2. An analysis of the four provinces/states public policies towards electrification of mass transit. 3. A presentation of case studies that present both success and failure in electrifying mass transit networks. and 4. Lessons learned from these projects.

PUBLIC POLICY: A DEFINITION

Dye proposes what is probably the simplest yet most complete definition of Public Policy: « Whatever governments choose to do or not do. »[1]. By any inaction or action, the government makes a decision in the course of how it acts and guides our society. According to the Institute for Policy Studies from John Hopkins University, Public Policy is defined as « the action

taken by government to address a particular public issue .»[2]. For the purpose of this paper, we will merge the two definitions in order to make our own definition of Public Policy: The Government's action or inaction towards a public issue. By using this definition as a starting point, we will quickly delve into Quebec's policy towards electric mass transit and compare it to the approaches of Colorado and California.

ELECTRIC TRANSIT POLICIES IN QUEBEC, ONTARIO, COLORADO AND CALIFORNIA

For over ten years the development of new electric transit projects in Quebec has been guided by several strategic plans. This can be attributed to energy surpluses as well as the economic prosperity of the province. Under the stewardship of the Liberal government of Jean Charest (2003-2012) hydroelectricity as well as renewal energy sources were some of the most powerful leveraging points for economic development and research. It was in 2010 with *Le plan stratégique québécois de la recherche et de l'innovation 2010-2013* that the government would begin to introduce public transportation foreseeing an investment of 60 millions dollars for the design and creation of an electric buses capable of competing in the international market. A few months later Hydro-Québec, the state-owned power utility would present its 2009-2013 strategic plan announcing financial support for the development of electric public transportation infrastructure, related to the development of the commercialization of key technologies.

In 2013, a change in power happened with the short-lived Parti Québécois government of Pauline Marois (2012-2014) that

would launch *le plan priorité emploi 2013-2017* within which we would find two main objectives. The first was to reduce the province's dependence on hydrocarbon energy followed by the second objective of increasing the development of electric transportation industries in Québec. The intent of the government was to create a more dynamic economy with electricity and improving the environmental agenda in Quebec all the while creating new markets to sell the excess electricity produced. As a means to realize the projects, the government had allocated an advance of 516.1 million dollars over three years to encourage the transition towards electrification in transportation.

This strategy contributes to sustainable mobility policy or towards the strategy of energy independence for the province. It aims equally to develop the electrical transportation industry in an effort to make Quebec an international lead in this domain, with investments of over 221.7 million. Within this amount, there is 50 million dollars planned in fiscal deductions and preferential electricity rates for attracting multinational companies for installing their facilities in Quebec. Furthermore, 62 million dollars is being allocated to increase development for structuring projects, 40 million dollars for technical innovation and 12.5 million dollars for the development of electric vehicles and electric car-share vehicles.

We can thus establish that the government of Quebec wishes, through the electrification of public transport, significant job creation, as well as an acceleration of public investment to reignite the economy and stimulate investments from individuals and companies alike.

Furthermore, Daniel Breton who had been Minister of Sustainable Development and the Environnement, Wildlife and Parks was demoted after 2 months to Parliamentary Assistant in charge of Transportation Electrification for the remaining 17 months of the government. However, his focus was primarily on the personal automobile and not mass transit.

During the last years of the Charest and Marois Governments, many projects were announced and subsequently cancelled.

Following our interviews as well as our literature review, we were unable to identify a specific policy such as the one that is in place in Québec in our other provinces and states. Various aspects of different policies may encourage electrification, but there are no policies that are geared directly towards this only power source. They are mostly geared towards lowering emissions, diminishing traffic and enhancing mobility. It is more of a relationship of Nevertheless, as we will see, this has not stopped these jurisdictions of building over the last decades a myriad of electric transit systems.

Project status

Recent projects in Québec

Project	Status
Electrification of commuter rail	Cancelled - Refusal of rail companies
Trolleybus in Laval	Cancelled - Replaced by electric bus project
Electric buses in Laval	Pilot ongoing - Manufacturer went Bankrupt
Aerial Tramway in Laval	Cancelled - Buildings in the way
Montreal Trolleybus	Cancelled - Replaced by electric bus project
Inductive fast charging bus	Cancelled - Politicians feared population’s reaction towards induction
Electric Midibus	Cancelled - Company went bankrupt before first bus was delivered
Montreal Tramway	Cancelled - Provincial government does not want to fund project
Montreal LRT	Planning is ongoing
Québec City Tramway	Cancelled - Mayor prefers BRT
Quebec City Electric bus project	Project will be terminated in 2015 and 7 buses will be sold for scrap

Recent projects in Ontario

Project	Status
Ottawa LRT Phase 1	Under Construction
Ottawa LRT Phase 2	Planning is ongoing
Toronto Streetcar Modernization	Under Construction
Eglinton LRT	Under Construction
Toronto Subway expansion	Under Construction
GOTransit electrification	Planning is ongoing
Hurontario LRT	Planning is ongoing
Hamilton LRT	Planning is ongoing
Kitchener-Waterloo LRT	Under Construction
Ontario HSR	Planning is ongoing

Recent projects in California

Project	Status
San Francisco Trolleybus modernization	Deliveries will begin in 2015
San Francisco Central Subway	Under Construction
BART expansion	Under Construction
Caltrain electrification	Project is ongoing, EMU RFP to be issued in 2015
Los Angeles Metro	Purple line construction has begun
Los Angeles LRT	Construction is ongoing on 3 lines and Regional Connector
Los Angeles Streetcar	Construction is planned for a 2016 start
California HSR	Construction started in 2014
Multiple Electric Bus Lines	Operational and more planned

LESSONS LEARNED

This research project has permitted us to propose 6 lessons learned. There are three main lessons learned as well as three corollaries.

The **first lesson** learned is that even without a specific Public Policy geared towards electric mass transit, projects may still happen.

The **second lesson** learned, a corollary of the first, is that even with a Public Policy geared towards electric mass transit, no or very little projects may go ahead.

The **third lesson** learned is that upstream planning in preparation of projects will help deliver well defined projects with a clear understanding of scope and costs.

The **fourth lesson** learned, a corollary of the third, is that a series of projects chosen by politicians and not transit planners and operators can bring about projects that cannot go past the pre-feasability phase.

The **fifth lesson** learned is that if there are dedicated funding sources (Colorado and California) they can happen.

The **sixth lesson**, a corollary of the fifth, is that without dedicated funding, subject to the whims of government as well as elections, the probability of projects going ahead diminish significantly.

Our study of Québec, Colorado and California has taught us that well planned and funded projects may go ahead. Our study has also taught us that even with a Public Policy supporting poorly designed and planned projects without a dedicated funding source, they are much less likely to go ahead.

Bibliography

The detailed bibliography for each project & policy is available by request as it has over a hundred references.

[1] DYE, Thomas, R. Understanding Public Policy, Fifth Edition, Prentice-Hall, p.1.

[2] http://ips.jhu.edu/pub/public-policy (consulted 13 December 2014)