Reviewer A:

This paper provides a novel view of Montréal’s Indoor City—a network of indoor pedestrian pathways in downtown Montréal. The authors explain why such a network is needed in the city core. A life cycle analysis then illustrates how the network has expanded over time. The authors also analyze the change in accessibility to retail space in the downtown area associated with major expansions of the network. This research provides clear evidence that pedestrian accessibility, among other policy and economic factors, has a critical effect on the growth of the pathway network that serves downtown Montréal.

My comments and suggestions are summarized in the following points:

1. I would like to see a review of network growth literature in order to better understand the motivation and methodology of this study.

More discussion was added as well as more lit review related to growth of networks and growth of indoor networks.

2. In warmer time pedestrians should be able to reach their destinations using streets, or a combination of outdoor sidewalks and indoor pathways. Increased congestion or parking expense on the street level, on the other hand, may drive more people to the indoor city. In this sense, networks of streets and indoor pathways are both competitive and complementary. By eliminating the street network from their analysis, the authors could have underestimated or overestimated the accessibility level. I like to see a discussion from the authors on this issue.

The complementarity and competitiveness of underground and street-level networks is not in the scope of this study. However, it is clear that the presence of an underground network has an impact on street level. For example, it is mentioned in the paper that the indoor city caused some buildings to be less opened onto streets, only offering blank facades or garage entrances to street users.

3. I have the feeling that with what the data authors have already assembled, something more rigorous can be done in addition to the life-cycle and the accessibility analyses. Maybe some sort of discrete-choice or time-series analysis further exploiting the data?

Thanks for the suggestion, yet the purpose of this paper is really to present the development of the Indoor City of Montreal and to examine accessibility changes that occurred in this network over time. A distinct paper examining other aspects of the Indoor City is in preparation concentrating on modeling the growth itself as suggested. We felt keeping statistical analysis out of this paper is important for the reader and the quality of the paper, so we can concentrate on one aspect and reach our goal.

4. I believe the S curve estimation presented in this study is not correct. It has to be in a negative exponential form in order to represent the consecutive phases of birth, growth, and saturation for a transportation system. I also would not agree with the authorsâ€™ discussions in the last paragraph of p.12 (phase-shift is signaled by a significant change in the expansion rate of a network rather than major expansions) and in the first paragraph of the conclusion.
part (the mature phase of a system is a spontaneous result of market saturation. The economic hardships may have an effect on it, but is not the cause) regarding the S-curve theory.

Correct. The “S curve” mentions were changed to “exponential function”.

5. As the authors recognized, access to metro stations and cultural/governmental activities of buildings is important functions of the indoor pathway network that are neglected in this analysis. This is especially important if we want to predict the locations of new buildings or pathways. I am not sure how different resources of accessibility could be accounted for in a comprehensive accessibility analysis or a statistical model.

The access to metro stations and cultural/governmental activities did have an effect according to the statistical model that was developed. However, a regular linear regression was used in an earlier version of this (see below). Yet we felt this is not the most appropriate way of modeling it and a more sophisticated model would be needed to really develop this aspect in greater detail. Also we felt the current paper is better if it concentrates more as a policy paper with minor analytical work in accessibility. This model as well as new ones are more likely to be the subject of a separate paper for which a growth curve model will be used.

**Retail Growth Model**

<table>
<thead>
<tr>
<th>Coefficients t Stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept          -29843.56 -0.42</td>
</tr>
<tr>
<td><strong>Building Size (square footage)</strong> 0.05 2.62***</td>
</tr>
<tr>
<td>(688876.0373)</td>
</tr>
<tr>
<td>Relative Accessibility Office (square footage) 2885055.88 0.08</td>
</tr>
<tr>
<td>(3.815805033)</td>
</tr>
<tr>
<td><strong>Relative Accessibility Retail (square footage)</strong> 11955.11 7.20***</td>
</tr>
<tr>
<td>(9.86187E-05)</td>
</tr>
<tr>
<td>Difference between built and linkage year -471.67 - 0.25</td>
</tr>
<tr>
<td>(10.20578572)</td>
</tr>
<tr>
<td>Building Age 1555.17 0.87</td>
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<tr>
<td>(36.51513508)</td>
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<td>Hotel Facilities 3199.37 0.07</td>
</tr>
<tr>
<td>(0.124311561)</td>
</tr>
<tr>
<td><strong>Cultural Facilities</strong> 63806.91 1.48*</td>
</tr>
<tr>
<td>(0.124311561)</td>
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<tr>
<td>Institutional Facilities -3285.76 -0.05</td>
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<tr>
<td>(0.184905226)</td>
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<tr>
<td>Parking Facilities -44241.58 -1.27</td>
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<tr>
<td>(0.752713933)</td>
</tr>
<tr>
<td><strong>1960s linkage</strong> -89617.58 -1.79*</td>
</tr>
<tr>
<td>(0.305419252)</td>
</tr>
<tr>
<td>Central Segment 10261.71 0.20</td>
</tr>
<tr>
<td>(0.767496739)</td>
</tr>
</tbody>
</table>

Note: mean is included in parenthesis
* Significant at 90% confidence level
***Significant at 99% confidence level
This was placed more as a future research section at the end of the conclusion.

I would encourage the authors to revise and re-submit this paper.

Reviewer B:

I greatly enjoyed reading the paper and am happy to provide what I hope are helpful comments. The authors did a commendable job of assembling and organizing a complex and important data set. Ultimately I think this work will make a worthy contribution to the literature. The data and analysis is appropriate for the stated goals of the research, so I will focus mostly on clarification and organization of the paper.

There are some areas where I think the paper can be strengthened. The first way to do this is to rethink the introduction. The intro as written does not effectively set up the analysis and conclusions. I recommend starting the paper with the last paragraph of the introduction and moving on from there.

The introduction was reorganized.

The second area for improvement is to better describe the policies that lead to growth in the Indoor City. The authors should combine the historical section with political background with their main network analysis section.

The two sections were combined. Thanks for such a good point.

In addition, some discussion of how important public policies are to network growth should be included. At times the authors argue that policies are critical yet at other times they seem to favour exogenous factors, such as economic decline or stagnation, as the main factor driving growth.

Clarifications concerning the role of policies were included. To summarize, policies did play an important role in facilitating the creation and expansion of the network. However, the main factor influencing the growth of the Indoor City network remains economic development as the private sector was responsible for the financing and construction of most links. The floor area ratio is considered more of a loophole in the system that developers took advantage of.

There aren’t any instances of the network shrinking from what the authors present, though I imagine that accessibility as they define it can decline if stores close or uses are converted away from retail. This leaves me wondering how the growth (and decline) of the Indoor City compares to the growth (and decline) of the city and/or region.

Precisions were added to the paper. The growth of the Indoor city was closely related to the evolution of Montreal’s economy. It is very hard to follow evolution on a store by store basis in the system, so decline was not present since no links were closed or no big changes in term of retail that was present, based to our knowledge and review of the literature. A clarification
section was added to address this comment as the measures were made to real retail space and not active retail space.

In the final paragraph of the analysis the authors introduce the valuation of individual links in the system. This is an important concept when considering the incentives to join the network for developers and policy makers. The authors can expand this discussion and greatly enhance the value of their work.

For the purpose of this paper, the value of the links is considered in terms of accessibility. Consequently, the value of a given link is demonstrated by changes it levels of accessibility.

Other notes and comments:

- What are the causes of the different approaches to enclosed pedestrian environments in North America and Asia? (This was noted in the 2nd paragraph of the introduction.) Are there policy implications from these approaches? Is there any interest in North America in separating pedestrians from cars? This is implied in the next paragraph. The impetus of the Montreal system should be framed in the context of separation of uses of protection from weather. Overall the introduction did not make clear the goals of the paper because the authors introduced so many ideas, but this is simply a need to rewrite and revise.

Differences between Asia and North America were explained more clearly; in Asia the limited availability of land and the need to recover part of high cost of land are critical factors in the development of indoor cities. In North America, it is rather a way for real estate owners to make more profit out of their properties. In both cases, the intent is also to provide a climate-controlled environment to attract clientele and avoid traffic conflicts.

- In the 3rd paragraph on page 11 the authors explain that the master plan turned towards system consolidation and away from expansion. I am unsure what this means, and the reference is omitted. This seems like a major point and deserves greater attention and detail.

Reference was added and precisions were brought. The consolidation phase consists of improving the quality of existing links, by improving signage and universal accessibility, for example, rather than creating new links.

- In Figure 4 the authors provide an equation from the network growth model but fail to discuss the coefficients. Is the data appropriate for a S curve? The authors’ discussion implied that the network is mature, but it’s not clear that this is the case. What future growth is expected? I think the easiest way to address these concerns is to eliminate the equation in the figure (but leave the figure in), which doesn’t seem to enhance the analysis. Table 1 is a much clearer way to convey growth.

The equation was removed.

- In Figures 5-7 the legends are difficult to understand. The authors present accessibility with six digits after the decimal point. This is unnecessary precision. The text should also explain how these breaks were defined. The first category is 0-18, but the last one is 3333-11089 (Figure 7). I suspect that the authors used a default setting in GIS rather than
establishing their own categories. Also, the change in access shown is Fig 7 is much less than the other years. The authors should explain if this is meaningful.

Clarification was added and new maps were inserted.

Reviewer C:

“Montréal’s Roots: Exploring the Growth of Montréal’s Indoor City” provides an interesting account of the conception and development of Montréal’s Indoor City. The paper provides information about the roles various plans, events, and policies in the City’s history that are useful in understanding how these factors contributed to the growth of the Indoor City. The paper could be improved by providing some clarification and/or additional information that strengthens the link between the events and policies to observed outcomes in the Indoor City. Additional information and clarifications are also needed in the methodology section, and a few sections could be reorganized or streamlined.

In the introduction section (page 3) the authors state “… in North America, they are intended as refuges from winter.” This is not always the case, as several cities in much warmer climates (Houston, Atlanta) have such systems. Perhaps change “winter” to “weather” or “extreme weather”.

The term “winter” was changed to “extreme weather”.

In this section there is also an issue with footnote #1 extending to the following page.

The layout problem was corrected.

In addition, this section talks about pedestrian networks in general and then seems to talk more specifically about the Indoor City without any clear transition (the 5th paragraph of the section). The references to Whyteâ€™s and Lorch and Smithâ€™s work perhaps belong in an earlier paragraph, before talking specifically about the Indoor City.

The introduction was reorganized.

In the Methodology section, more information would be helpful. Is the Origin-Destination matrix coded within the GIS database? Was the matrix developed using a separate program and then inserted into GIS? Why was square footage used when the rest of the paper presents information in SI units?

Yes the OD was modeled in GIS using ArcGIS network analyst and the indoor city network as the network to measure the accessibility to retail and to office space. The data available for retail and office space has been mainly present as square footage so we felt for consistency with the original data sources we should keep things at the footage. Yet we used the SI systems in parallel in several cases for international readers.
In the “Factors Surrounding the Conception of the Indoor City” section, perhaps the paper might flow better if the Visionary Thinkers subsection was first since the authors claim these to be some of the most significant factors to getting the system started.

The Visionary Thinkers subsection was moved at the beginning of the section as suggested.

Additional information regarding how the policies of Mayor Jean Drapeau led to the growth of the Indoor City would be helpful. Were the new developments required or encouraged to expand upon the Indoor City?

The mayor’s intervention was important as he pushed forward the development of new mega projects for the city, and more specifically the metro, which is an essential component of the Indoor City. The new indoor developments were encouraged by the availability of emphyteutic leases and FAR exemptions as mentioned elsewhere in the text.

In the Climatic Factors subsection, the authors state that “the climate was certainly not the principle cause for the Indoor City” according to Barles and Jardel (2005). Did their work mention what they believed to be the principal cause? If so, it may be worth stating in the appropriate section.

The main cause was the will of CNR to make their property more profitable by taking advantage of the underground space they owned. That was added in the section.

The second and third paragraphs of the Planning Tools subsection would be more appropriate for a “lessons learned” section.

A “lessons learned” section was generated which includes the aforementioned paragraphs.

The meaning of “consolidation” needs clarification. In the “Visionary Thinkers” subsection, the authors state that “The 2004 Montréal Master Plan adopted a new tone towards the Indoor City by turning its attention to system consolidation (), rather than further expansions”. In the “Cycle III: Consolidation (1980s to present)” subsection, the authors state “The 1980s ushered in a new growth cycle for the Indoor City, with a focus towards consolidating the network. The sentences after this statement generally document further expansion.

This section was clarified.

There are a few minor instances of incorrect grammar or spelling, but they do not detract from the understanding of the material presented.

Spelling check performed.