Reviewer A:
Thank you for your thoughtful review. We believe we have responded satisfactorily to your concerns. Your comments helped us refocus our motivation for the paper, identify our contribution more clearly, and underscore candidly the limitations (and next steps) of our work. Please see below for a description/discussion of how we addressed your major comments.

Q: There is a large body of literature on residential location choice that the author has not comprehensively reviewed….accessibility to employment opportunities throughout a given study area has been examined through location indicators, zonal employment density/intensity, distance to major employment centers, and various forms of accessibility measures (which deserve careful review in this paper). The statement that ?[past] studies have rarely analyzed accessibility to employment subcenters? (p.2) and similar comments throughout the paper are not cognizant of the state of the knowledge on this subject.

A: Thanks for the suggestion on the literature review. We have expanded the review to include different accessibility measures used in previous studies (Please see Pages 1-4). Specifically, we briefly discussed early measures of accessibility simply accounting for travel time or distance or cost between origin and destination, the cumulative opportunity measure, the gravity-based accessibility measure, the utility-based, the constraints-based measure, and the composite accessibility. We have also deleted our previous statement that past studies have rarely analyzed accessibility to employment subcenters, and we have clarified our contribution.

Q: The measures of employment accessibility used in this paper and the way in which these measures are incorporated into the choice utility function do not seem innovative. I suggest that the author more carefully review the literature and be more explicit about any original ideas introduced in the work.

We have devoted more time to the literature review, highlighting what the reviewer suggests are prevalent measures of accessibility in order to distinguish our contribution. However, we respectfully disagree with the reviewer that the access measures are overly simple. We've clarified now how we measured access, using a generalized cost function from a multimodal (motorized and non-motorized) mode choice model. The manuscript now highlights the

advantages of the model and of including non-motorized modes. The use of a gravity function which is more common is useful but we think less desirable in this case, as a generalized cost function has behavioral properties that we believe are superior to an a priori specified gravity model.

Q: The paper claims to distinguish the agglomeration (complementary) vs. competition (substitutive) effects of polycenters. However, the treatment of these effects through using individual and combined accessibility measures is overly simple. For example, the negative sign associated with the accessibility to subcenter #3 could be due to unique characteristics of the CBD, rather than an indication of competition. The related statements in the conclusion (line 6~10, p. 21) are thus not properly substantiated.

A: The access measure is implemented in three different ways: First, we measure access to the closest subcenter. Second, we measure access to each subcenter individually; and third, we measure cumulative access to all subcenters. We follow Anas, Small and Arnott (1998) in how we model accessibility to different centers. We don't believe simplicity is a undesirable –in fact it allows a more transparent understanding of the work. Surely, a gravity model or some form of entropy could have been used. However, from a theoretical standpoint, the utility function of a random utility-based mode choice model is linear and additive. Thus, to maintain transitivity it is imperative that any operations with utility functions remain additive (or multiplicative). This allows us to compare apples with apples, and does not excessively penalize (or benefit) distant (or close) destinations. We could have included a multiplicative term, but again, this would create additional complexity in interpretation in an already-long paper. Beyond that, other transformations with the utility-based access measures would not be defensible.

We agree that the specifications are not complete or exhaustive tests of complementarity or substitutions. Thus, our claims resulting from our results have been toned down and more caveats (as the one highlighted by the reviewer) added.

Q: **Compared to recent works on the same subject, this paper has considered very few socio-demographic variables. Although income ? which is the primary socio-demographic**

variable considered here ? is an important variable, previous studies have also found that school quality and household structure (stage of life cycle) play a significant role in the decision making of residential location. Failing to consider these key variables may lead to biased results.

A: To clarify, we included income, number of children, number of workers in the household, and number of motorized vehicles owned. So we disagree that very few socio-demographic variables were included. A more complete capturing of household stage (e.g., retiree vs. dual-income empty nesters vs. none) is likely to be well predicted by the variables already included in the paper.

Q: **The utilization of several correlated measures of the built environment is also a major concern. If my understanding of the description is correct, the neighborhoods are defined based on walkability and accessibility, which are then again introduced as independent variables in the utility function. It would be useful to examine and report the correlation relationships.**

Yes, the built environment entered the models through two explicit variables: walkability and local accessibility. The built environment also entered the models indirectly, through the neighborhood types (1-8). Finally, to the extent that the built environment is correlated with access to subcenters, then it will also be exerting influence on results through the accessibility measures.

This excellent comment prompted us to revisit our model and calculate variance inflation factors. Before presenting our results (now included in the manuscript as well), it is important to mention that high colinearity can cause high standard errors, but not bias. Thus, our concern here is in not finding results that are statistically significant when in reality they are. To reiterate, it's a problem of identification, not bias.

The following table shows variance inflation factors for all TAZ-related attributes. It suggests that colinearity is not an issue for the built environment measures (or the ntypes or the overall accessibility measures). A rule of thumb is that a variance inflation factor more than 5 is problematic (ie that less than 20% of the variance in a given variable is unique to it). What the

VIFs in the table do reveal is very high colinearity among the individual access measures to each

Variables	Definition	VIF	Obs	Mean	SD	Min	Max
TAZ Characteristics							
per_black	% black residence (BLACK / POP)	1.35	1024	8.646	16.092	0	100
ntype1A	Core CBD & CBD with residence (ntype 1 and ntype 2)	2.54	1024	0.24	0.43	0	1
ntype3	First ring of suburbs	1.37	1024	0.47	0.50	0	1
ntype4	Second ring of suburbs	1.41	1024	0.31	0.46	0	1
ntype5	Suburban single family residences with some commercial and transit services	1.63	1024	0.24	0.43	0	1
ntype6	Suburbs with low regional access	1.24	1024	0.21	0.40	0	1
ntype7	Exurbs with low regional access (Reference)	2.28	1024	0.16	0.37	0	1
ntype8	Isolated residences in forested, industrial, & commercial areas	1.27	1024	0.23	0.42	0	1
each_acc1	Minimum access to subcenter 1	5.95	1024	-39.74	13.06	-69.77	0.00
each_acc2	Minimum access to subcenter 2	8.35	1024	-34.05	11.09	-64.46	0.00
each_acc3	Minimum access to subcenter 3	17.50	1024	-21.42	11.64	-60.39	0.00
each_acc4	Minimum access to subcenter 4	23.47	1024	-31.01	11.89	-66.87	0.00
each_acc5	Minimum access to subcenter 5	29.78	1024	-30.37	12.51	-70.23	0.00
each_acc6	Minimum access to subcenter 6	43.42	1024	-29.52	12.42	-69.67	0.00
each_acc7	Minimum access to subcenter 7	79.34	1024	-34.38	13.18	-74.10	0.00
each_acc8	Minimum access to subcenter 8	73.67	1024	-36.74	13.54	-77.45	0.00
each_acc9	Minimum access to subcenter 9	22.16	1024	-38.12	13.10	-75.08	0.00
each_acc10	Minimum access to subcenter 10	21.14	1024	-26.84	12.02	-62.56	0.00
min_acc	Access to the closest subcenter	4.09	1024	-48.23	9.72	-77.45	-30.07
sum_acc	Cumulative access to each subcenter	3.47	1024	-322.19	82.67	-651.90	-214.82
walkability	Derived factor	2.83	1024	0.63	1.46	-1.32	8.32
accessibility	Derived factor	1.48	1024	-0.001	1.20	-3.44	5.02
Interaction of TAZ and Household Characteristics							
mpv_inc	Mean housing price / household income	1.03	1510	6.15	17.64	0.01	241.90

subcenter.

Reviewer C:

Thank you for the thoughtful review. We believe we have responded satisfactorily to the concerns raised by the reviewer. Your comments helped us refine our paper by clarifying critical sections and presenting results. Please refer to the manuscript for numerous changes motivated by your comments. Below we summarize major comments you provided and our reaction to them.

1. The data section should be expanded. It would be particularly helpful to have some more information about the Charlotte travel survey.

We've added more information about it:

"This paper uses the data obtained from the 2002 Greater Charlotte Region Household Travel Survey. Surveyed households were selected using List-Assisted Random-Digital-Dialing from the directory-listed phone numbers. A total of 1,510 households in Mecklenburg County were sampled. The households completed travel diaries and provided 24-hour trip information during weekdays between January 13 and May 7, 2002. "

2. As a person who is not well-versed in conditional logit models, is it common to have the variance be a function of demographic variables while they are not included in the underlying expressions for utility?

Yes, this is common, although in the context of conditional logit models demographic variables need to be interacted with specific alternatives. The information for estimation comes from variation across alternatives, and thus variables like price or travel time vary naturally from choice to choice. But attributes of the chooser don't vary (by definition) and therefore the a priori definition of their effect on particular alternatives is required.

3. Many models are estimated and only the best are presented. Are the models selected according to the BIC criterion?

Yes. We explained this in the last paragraph of page 13 and the footnotes (numbers 8 and 9). We've now clarified this further. Raftery (1996 and the literature cited therein) encourages the use of BIC to compare non-nested models.[1]

"Since the heteroscedastic models perform better than the conditional logit models, our results focus exclusively on the heteroscedastic logit models. Among these, those with sampled choices have much lower Bayesian Information Criterion (BIC) values than those with the full choice set for all income groups. This indicates that the models with sampled choices fit the data better than those with the full choice set….."

[8] All conditional logit models converged satisfactorily with McFadden's adjusted R^2 (adjusted rho-square) values between 0.018 and 0.38. For all income groups, McFadden's adjusted R^2 values are much higher for conditional logit models with sampled choices and with access to each individual subcenter than they are for other models. McFadden's adjusted R^2 is meaningless in the heteroscadestic models where the number of degrees of freedom is less than the number of parameters. Thus, we used the Bayesian Information Criterion (BIC) to compare the conditional logit models to the heteroscedastic logit models. We found that the heteroscedastic logit models were consistently more favorable than the conditional logit models with much lower BIC values. This suggests that accounting for unobserved response heterogeneity across households provides additional explanatory power.

[9] $BIC_i = -2l_i + k_i \ln n$, where l_i is the maximum log-likelihood for *i*, k_i is the number of free parameters for *i*, and n is the number of observations.

4. Two sampling alternatives are chosen to limit the size of the model ? random sampling and a rule based on housing affordability. I am more familiar with the former than the latter; how does the deterministic rule affect the estimation procedure and the calculation of standard errors?

We now mention this more clearly.

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[1] Raftery, A.E. (1996) Bayesian model selection in social research. In P.V. Marsden (Ed.), Socio,ogical Methodology, Vol 25, 111-163, Oxford: Basil Blackwell.

“Based on the well-known result that a sample of choices results in consistent estimates of the multinomial logit model (McFadden, 1978), we reduced the choice set using both a random sampling approach containing a sample of non-chosen TAZs and a chosen TAZ for each household (Miller et al., 2004) and an approach that includes both a deterministic and a random component.

For the deterministic and random approach, we used housing affordability as a deterministic rule to reduce the choice set, based on the suggestion by Levine (1998) and others that housing affordability constrains residential location choice for households. In this way, we included only TAZs within a housing affordability threshold, defined as the ratio of the median home price in the county to the median household income of each respondent. This financially-available choice set may lead to more consistent and unbiased estimates and to smaller standard errors than the universal choice set (that also includes financially-infeasible choices) does.”

5. Although residential choice is modeled explicitly, the job location choice appears to be taken as exogenous. Although this assumption is probably reasonable, some discussion is warranted.

We’ve clarified this in the introduction by arguing that the workplace choice is endogenous to residential location decision-making, and thus any employment subcenter is a potential workplace for both workers and non-workers (some of whom may be searching for jobs currently or in the future).

In the discussion section we do mention that an improvement may be to examine whether assuming exogeneity of workplace locations (for workers) adds explanatory power of the model, and depending on the results it is possible to determine whether that current employees may be balancing current commuting requirements (related to the current job) with potential commuting requirements from future jobs.

6. Three measures of subcenter proximity are used ? distance to the nearest subcenter, separate variables for distance to each, and the sum of the 10 distance variables. It is not

clear how the 10 separate variables are eventually restricted to three in estimation. Using the sum of the 10 variables as a single distance measure is unconventional. Why not use a gravity-style variable, such as the sum of the inverse distances?

We've clarified now how we measured access, which was not using distance but using a generalized cost function from a multimodal (motorized and non-motorized) mode choice model. The manuscript now highlights the advantages of the model. The use of a gravity function is useful but we think less desirable in this case, as a generalized cost function has behavioral properties that we believe are superior to an a priori specified gravity model. One advantage of the gravity model would be to give a weight based on the number of employees to each subcenter. Yet, since we are limiting our scope to subcenters, this is less relevant.

The access measure is then implemented in three different ways: First, we measure access to the closest subcenter. Second, we measure access to each subcenter individually; and third, we measure cumulative access to all subcenters. The one choice up for debate and exploration (and hence the paper) is our inclusion of the cumulative sum of access measures to all subcenters. From a theoretical standpoint, the utility function of the mode choice model is linear and additive. Thus, to maintain transitivity it is imperative that any operations with utility functions remain additive. This allows us to compare apples with apples, and does not excessively penalize (or benefit) distant (or close) destinations.