

### Major Comments:

1. In the introduction weak spots of the GMPEs and GMMs in general are mentioned. Site-specific GMPEs may overcome the shortcomings of GMPEs but it requires adequate number of data to work. This can also be added to the Introduction section. Providing an analysis of the GMPEs vs. synthetic PGAs can also give an idea of the how current GMPEs are performing for Tomorrowville.
2. Some of the parameters related to the subsurface features (velocity profile, density etc.) are given in Table S1. It would be better to provide grid resolution in the same table or moving all these information to Section 3.
3. In Line 171 it is mentioned that  $\Delta$  and  $A$  are not influenced by the source characteristics. Since both stations and earthquakes are randomly distributed, there is a chance of some event-station combinations might have directivity effect. As we do not have the exact information related with source characteristics, it is a bit hard to say if the statement in Line 171 is really respected or not.
4. In line 270-273 how kinematics of the fault planes are determined are explained. It would be better to do the same for the fault plane dimensions. Same applies for the rupture velocity summary of the events. These information needs to be presented to better understand the features of the synthetic ruptures.
5. In Line 282-286 it is said that  $A$  is the parameters that is going to be analyzed. However, in the paper  $\Delta$  is also densely analyzed.
6. In Line 308, it is said that only the horizontal components of PGA values are used for the intensity measures. However, in Figure 4 vertical components are also included in the spectral acceleration plots. Moreover, non-strike slip faults may produce significant vertical amplitudes. In fact, in Figure 4, in several cases spectral acceleration has larger amplitudes than the horizontal one. Did authors analyzed the amplitudes of the vertical components?
7. In Line 334-337 it is stated that the focus will be on Tomorrowville sub-domain but in Figure 3b the PGA values are retrieved in the whole area not only from the Tomorrowville. Moreover, I do not know how to reach to the conclusion of having negligible uncertainties by looking Figure 3b. Can authors expand this part?
8. Since the station distribution is random, interpolation of PGAs in Figure 4 can be biased. Did author used evenly distributed stations to analyze the effect of station distribution on maps?
9. First three paragraph of the Discussion and Conclusion has a good connection with the beginning of the Introduction section. However, they have nothing to do with the results of the paper. They may reorganized and move to the Introduction section. The subject that is introduced in the Introduction and expanded discussion and conclusion section is a very important topic. It is just not the main topic of the paper. Hence, I believe they need to be presented only in the introduction section.

### Minor Comments:

1. Line 267 – When the earthquake distribution is introduced the type of faulting also has to be provided. This information is given Line 327.
2. Supplementary Movies cannot be found in Supplementary Material.
3. Figures must be reorganized; subplots has to be better aligned, sizes of the subplots need to be reconsidered.
4. Line 612-613 – I believe this sentence belongs to other parts of the discussion section and needs to be further explained.
5. Some sentences are a bit too long and it can be hard to follow (such as Line 576-579 and Line 589-592).

### Editorial Comments:

1. Line 81 – “For example” seems unnecessary.
2. Line 179 – significance of the **bold** letters needs to be explained.
3. Line 269 – Citations of the SPEED are given between two dots. The dot in Line 269 should be deleted.
4. Line 276-278 – Movie S4 is mentioned before Movies S1-S3.
5. Line 280 - “... to understand seismic hazard must”, I believe it needs to be “is a must”.
6. Line 318 –  $\Delta_r$  is used two times in the sentence.
7. Line 340-341&343 – Figure 4c is introduced before a and b (Line 343).
8. Super/sub script of some letters are required, eg. Figure 3b y axis label.
9. Figure 6f is neither mentioned nor discussed in the text.
10. Line 379 – “TV” is not introduced.
11. Line 414 – Day et al. 2019 can be cited inside parenthesis in the end of the sentence.
12. Line 426 – The second comma is in the wrong place.
13. Line 545 – Figure 7A should be Figure 7a.
14. Line 566 – “... A field”. A should be **bold**.
15. Line 599 – “It’s noteworthy ...” should be “It is”.
16. Bielak and Ghattas 1999 has a doi number. [https://doi.org/10.1061/\(ASCE\)1090-0241\(1999\)125:5\(413\)](https://doi.org/10.1061/(ASCE)1090-0241(1999)125:5(413))
17. Frankel, A. (1993) has a doi number. <https://doi.org/10.1785/BSSA0830041020>
18. Hough and Anderson 1988 has a doi number. <https://doi.org/10.1785/BSSA0780020692>
19. Nath and Thingbaijan 2011 has a doi number. <https://doi.org/10.1007/s10950-010-9224-5>