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Meeting notes_006_FEM2.0_Phase1_Meeting_2 Mar 18 FINAL.pdf	versus	**Meeting notes_006_FEM2.0_Phase1_Meeting_2 Mar 18 DRAFT C_1.pdf**
21 pages (598 KB)		**8 pages (308 KB)**
23/3/18, 1:52:05 PM		23/3/18, 5:52:51 AM

Total Changes

36

Text only comparison

Content

13 Replacements

9 Insertions

14 Deletions

Styling and Annotations

0 Styling

0 Annotations

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DRAFT MEETING NOTES

HNVFRM Flood Evacuation Model (Generation 2.0)

PHASE I – Assumptions and outputs workshop

Ref: 006.FEM2.0.PhaseI.180302 DRAFT

MEETING INFORMATION

Objective: Finalise assumptions and performance measures and capture user expectations with interface.

Date: 2 March 2018

Time: 10:00am – 4:30pm

Location: CSIRO Data61 Offices, Door 34, Goods Shed, Village Street, Docklands, Melbourne

AGENDA

Description: Technical discussions to progress matters needed towards the concept design.

Attendees: John Hart, Paul Leonard, Kris Nguyen (RMS), Peter Cinque (SES), Paul Fuller (INSW), Kam Tara, David Pavey, Del Marta (URaP), Mahesh Prakash, Dhirendra Singh, Rajesh Subramanian, Vincent Lemiale (Data61), Pieter Fourie (MATSim)

Apologies: Leorey Marquez (Data61)

No.	ITEM	LEAD	TIMING
1	Welcome	M Prakash	10 mins
2	Model assumptions and inputs	K Tara / J Hart	140 mins
	LUNCH	-	12:30 (60 mins)
3	Model outputs / performance measure expectations	All	90 mins
4	User expectations with interface / Workspace	M Prakash	60 mins
5	FEM 1.2 simulations and progress (separate project)	D Pavey	20 mins
6	Close – summary of outcomes and actions	K Tara	10 mins
	CONCLUDE	-	16:30

OTHER NOTES

Information provided at the meeting included:

Attachment A FEM1.1 assumptions review

MEETING NOTES

General comments

- The main purpose of producing the prototype is to demonstrate which items in the wish list may or may not work.
- Use the term 'design elements' instead of the term 'assumptions'
- Some design elements are fixed, and some are variable.
- Should provide all design elements in one document and group them into different categories. Some are model concepts, while other ones are policies. They need to be identified as such.
- Document of design elements is highly likely to require updates as the project progresses. It will need to be a living document.
- To assist with prioritising the design of potential variable inputs, the variable elements should be identified as either primary (main) or secondary (desirable) or similar.
- Document should include additional information such as attribute type (e.g. relates to input data, model, policy, etc.) and who is responsible for it.
- Need to confirm each of the design elements on the FEM1.1 list of assumptions (produced by Hala) is still applicable to FEM2.0.

Road network scale impediments

- Refer 1A: Intersections will be treated so won't be a constraint on network. This is through subsectors and local impediments and applying a traffic safety factor.

✓ FEM2.0 no significant small-scale impediments are applied to the evacuation network (existing or future)

Evacuation timeline

- Refer 2O: The traffic safety factor (TSF) provides extra time (spare / slack) for evacuees to evacuate an area. It allows for when the evacuation is to start. The TSF for FEM1.1 was variable but was fixed to 3 hrs.
- For FEM1.1 TSF figures were predetermined and input into the model (i.e. the model did not calculate).
- The selection of TSF figures needs to be either supported by evidence.
- The model could calculate and assign.
- From a legal perspective need to be able to defend the source or method in generating the figures.
- Desirable to have the TFS adjustable for each subsector. Could be fixed (same as in evacuation planner) or variable across each subsector (~258 subsectors).
- Could embed demand generation in MATSim (optimise approach), but this would have a significant impact on the interface (Workspace). Workspace could do things like this, but it would not exactly be a dial. Any work in this area would be experimental. It would add more technical work to the project. It may also raise issues with data tuning as no one would be over-looking / checking it.

✓ FEM2.0 use same approach as used in FEM1.1

✓ FEM 2.0 URaP & SES would be responsible for optimising the TSF figures and documenting.

✓ FEM2.0 design needs to provide for the TSF figure to be changeable per subsector. Aim is to keep globally the same, however provisions are needed to change as needed.

⇆ Consider developing the optimise approach in FEM2.1 (R&D model).

Road network extent and coordinates

- Refer 1B, ID & 1G: Each 10-year interval will be provided a base case road network. This road network will not include evacuation upgrade projects.
- RMS can provide / come up with the total future network.
- Issue is how the model would accommodate road network changes / future upgrades. Is it input the total network and switch on / off or add / change the network for each case.
- Benefit of incorporating the total network upfront and switching on/off is that will always be comparing the same network with simulations. The shortcoming of adding / changing the network for each case is that will be comparing different networks and there is no way of comparing node or agent changes.
- It is difficult to foresee problems on the network and their potential solutions. There will always be a need to add new links. There are a lot of options that could happen. This issue applies to both approaches.
- Need one network to build for model. Quality control measure.
- Deal with one network and ability to turn on or off.
- Better to use GIS to create and analyse shape files. Once correct then save into input file. Also, better to store all input and output files together and easier to reference.
- Changes to links should be bundled. There needs to be a change set for each base network. Should not be a manual process.

✓ FEM2.0 will have separate network files and use same process as used for FEM1.1

✓ FEM2.0 is to have base case network and a version of network which has all elements which can change.

✓ FEM2.0 design system so can accommodate changes and have provisions for turning links on-off.

⇆ RMS will supply the latest network, and document of network data sets for Phase II.

Evacuation travel speeds

- Refer 1C: EMME produces unconstrained travel speeds.
- Speed limits are imposed in model and therefore traffic can only move at maximum speed assigned. Under no congestion, MATSim drives at speed limit (e.g. 50 km/hr for lower order roads and 70 km/hr for higher order roads). The evacuation duration is directly related and based on that speed.
- MATSim checks whether the flow capacity for the next link has been reached or not, once it has been reached it won't allow a vehicle to pass into the next link until capacity is available in the link (i.e. vehicles have moved on).
- Very critical element. Need to review what are the upper limits of travel speeds.

✓ Speed constraint is based on the road hierarchy.

⇆ URaP & RMS to review the upper limits of travel speeds and advise for Phase II.

Evacuation capacity

- Refer 1E & IF: this is an input-built figure and not a model calculated figure.

✓ FEM2.0 road capacity for evacuations is based on the road hierarchy.

✓ FEM2.0 evacuation road capacity is 600 vehicles / hour / lane for lower order roads (e.g. Local Collector Roads and below) and is 1/3 reduction on the actual road capacity for higher order roads (e.g. Regional Collector Roads and above).

⇆ URaP and RMS to review and advise actual road capacity figures for each road for Phase II.

Contra-flow lanes

- Refer 1H: needs to be documented.
- Only modelling one-way travel direction.
- No capability required in Workspace. It would be an artificial link on network if included.

✓ FEM2.0 based on one-way travel directions for evacuations.

⇆ URaP and RMS to document reasons for not using contraflow.

Flood levels

- Refer 3A & 3D: modelling to be based on current dam height and 14m extension. The hydrographs for 14m height were used in FEM1.1 and will not change. A new set of hydrographs may be required for a 17m height (if needed).
- In the future climate change will change the hydrographs. This is highly unlikely to be available for FEM2.0. Once available, will be applied as a sensitivity test.

✓ FEM2.0 based on hydrographs for existing dam height and 14m dam height.

✓ FEM2.0 climate change implications and 17m dam height are not considered and are to be managed through sensitivity testing.

Flood hydrographs

- A hydrograph is provided for each subsector and is based on the first part of that subsector that is inundated and needs to be evacuated.
- Auditing of road levels does not need to be revisited as previous drove road and identified low points.
- Do we adopt same used or reduce?
- When network changed height then interpolate hydrograph. Could have more hydro if road could go higher. In description of network file.
- FEM1.1 based on 12 hours or 15 hours forecast for event to happen.
- Use global parameter, that can be changed across subsectors Windsor 15 hours, 13 hours or shorted at Penrith.
- Crucial element. Influences risk to life.
- Should change globally or in groups in model.

✓ FEM2.0 apply WMAwater hydrographs / information used in FEM1.1.

Potential new river crossings

- Refer 2A & 2M: Evacuations to the west of the river are towards the west (mountains), and evacuations to the east of the river are towards the east (Sydney city). Additions of new bridges across the river will only change the safe node location.
- More importantly is to look at local road options that should be included in the base case dataset. For example, Dunheved Road – Werrington Road connection to Great Western Highway.

✓ Catchment areas for evacuation routes generally do not change with any additional river crossings.

Evacuation sub-sectors

- Refer 2B: Use existing subsectors as defined in FEM1.1. Penrith area may need to be re-examined.
- Prefer one dataset for development of the model, as don't want to keep re-validating. Once the model is developed then can change.
- Where evacuation timeframe is shortened for a subsector may need to consider dividing the subsector or assign more than one road exiting the subsector.
- Generation of employment by subsector is difficult.

✓ FEM2.0 testing to be based on one set of subsectors.

⇆ URaP and SES will provide test data for use in the demonstration prototype.

⇆ URaP & SES will review subsectors, document and advise for Phase II.

Evacuation populations and workforce

- Refer 2C: HNVFRM Directorate is producing population data. INSW will document.

⇆ INSW will supply population data and document population data sets for Phase II.

Residential evacuation demand

- Refer 2D: this is directed at the Penrith area.
- Car ownership has not really change over the years based on census data.

✓ FEM2.0 based on current census data indications.

Evacuation of institutions and special cases

- Refer 2E: Assuming if occurring happens at start of evacuation period and does not impact evacuation traffic. Doesn't change any behaviours in model.
- Further research needed to test assumptions.

✓ FEM2.0 is managed through population data.

Evacuation order compliance

- Refer 2F: Need to document any counter flow effect due to non-compliance. Non-compliance means have gone a different way and therefore make another road more congested.
- Background traffic is interconnected.

✓ FEM2.0 based on 100% compliance because of communication campaigns.

Evacuation mode of travel

- Refer 2G & 2I: no multi-modal questions that this model is expected to answer. More a policy issue.

✓ FEM2.0 based on evacuations by private vehicle only.

Reverse travel

- Refer 2H: need to explain and document situation.
- May need to review to check that this is not an issue.
- Assuming all cars are there in subsector and are being used to get out.

✓ FEM2.0 based on one-way travel for all evacuees from their subsector to a safe node. There are no return trips or multi-destination trips within the evacuation area.

Shadow evacuation

- Refer 2J: not considered a major issue.

✓ FEM2.0 based on no provisions for shadow traffic.

Evacuee destinations

- Refer 2K & 2L: likely to be one main evacuation centre, this effects distribution of traffic but not model design. Exit nodes from subsectors are called evacuation nodes, and the last point of modelling have always been called safe nodes.
- Will not directing people to specific safe nodes. There are multiple safe nodes to prioritise people's behaviour. The safe node is not an evacuation centre. The safe node priority is based on shortest distance.
- Operational will be advising people to go towards a specific exit route for an area and from there they will be guided towards safety. Along the routes, the major intersection will be controlled, and they will be guided.
- Need ability to turn safe nodes on / off.
- Assumes once past a safe node that there is no impact on traffic flows leading towards the node.

✓ FEM2.0 is based on safe nodes.

✓ FEM2.0 there is no traffic congestion beyond the safe node and no traffic flow impacts.

Evacuee choice of route

- Refer 2N: will be a managed exercise. There is no free-choice for evacuees.

✓ FEM2.0 route options for evacuees will be prescribed.

Evacuation departure curve

- Refer 2P: produced a working paper on it. All summarised.
- The type of evacuation departure depends on scenario and is managed within the data input.

✓ FEM2.0 based on a linear curve as the default for each subsector.

✓ FEM2.0 provision to select an alternative profile curve and apply it uniformly across all subsectors.

Background traffic

- Refer 2Q: most likely related to convergence issues.
- Proposing to use EMME model to calculate and overlay evacuation demand at specific intersections, and then run through micro model to indicate performance.
- Better to interject intersection performance into MATSim and customise the behaviour of those vehicles.
- Need to agree upon what it means to be in congestion. It then becomes dynamic re-routing in the simulation.
- Need to run simulations and see if congestion is significant and then deal with it.

✓ FEM2.0 based on no background traffic (initially and for prototype).

✓ FEM2.0 congestion is to be reviewed following simulation outcomes.

Other matters

- Need to get a list of model outputs (i.e. contents of MATSim output file and an explanation of the type of information captured).
- On target for demonstration prototype delivery at the end of April.
- Performance measures will be reviewed in a separate session.

FEM 1.2 & FEM1.2P

- URaP will develop two separate project plans for this component.
- Principle is to use FEM1.1 with minor modifications (i.e. save MATSim output files and integrate better with visualisation to examine results).
- FEM1.2 is to look at the effectiveness of road upgrade works on the four principle evacuation routes. This relates to the Resilience Project.
- FEM1.2P is to provide information on the effects of:
    - Warragamba Dam upgrade;
    - Intense development within the Penrith CBD area; and
    - Intense development within the Marsden Park North, West Schofields and Jordon Springs areas.

NEXT MEETING

Technical meeting is Wed 7 March 10-11am via video conference focusing on portal links.

ACTIONS

Action	*Who*	*By*
1. Provide typical information that is contained within MATSim output files.	Data61 - DS	7 Mar
2. Supply latest input data files including road network, populations and safe node priorities for use in the demonstration prototype.	URaP	7 Mar
3. Develop project plans for FEM1.2 and FEM1.2P projects.	URaP	15 Mar
4. Confirm each design element from FEM1.1 is still applicable to FEM2.0 (produced by INSW)	URaP	23 Mar
5. Review all design elements and identify / prioritise the desired variable elements.	URaP	23 Mar
6. Create a document which captures all design elements, categorises them, prioritises variable inputs, identifies the attribute type and responsibility.	URaP	29 Mar
7. Supply latest road network, populations and safe node priorities and document of network data sets for Phase II.	RMS	TBA
8. Review upper limits of travel speeds, document and advise for Phase II	URaP / RMS	TBA
9. Review and advise actual road capacity figures for each road for Phase II	URaP / RMS	TBA
10. Review subsectors, document and advise for Phase II	URaP / SES	TBA
11. Supply population data and document of population data sets for Phase II	URaP / INSW	TBA