SATURN User Group Meeting: Leeds October 18 2012

Presentation by Dirck Van Vliet

BATTING ORDER

- Entry Rant
- SATURN Futures
- 11.1 & 11.2 Releases
- Bugs in 11.1 (App. E)
- Specific Program Upgrades(App D.19&20)
- Network Aggregation (SPIDER) Extensions
- Uniqueness and Flow Proportionality
- Ideas and Objectives for 12/13
- Exit Rant

ENTRY RANT (To The Nation!)

- WebTag Unit 3.19 out (Hurrah!)
- Problems with speed-flow curves not resolved
- Need for open discussion forums (Linkedin?)
- Lack of innovation; e.g., peak spreading, variability, etc. etc.
- University research and practice too far apart
- Concerns over the convergence of supply-demand models and …
- … Non-uniqueness of path flows (see later)

SATURN FUTURES

- DVV qualifies for free ski pass!
- Atkins to expand its user support base
- Potential for collaboration with external agencies (e.g., consultancies, universities, individuals)

Potential In/Out-house Projects

- A new front-end for MX
- Fuller integration and testing of CASSINI
- Further development of mixed FW-OBA transition models
- Motorway merges
- Easier integration with micro-simulation models

… Projects

- How best to use Tag Unit 3.19 speed-flow curves
- Integration with GIS front-ends
- Development of front-end data bases (possibly via GIS systems)
- On-going SATME2 extensions, eg to make use of new blue-tooth style data or sector-to-sector updates

… Projects

- Improved data entry systems, e.g., Code-A-Node
- SATURN Courses
- Incident modelling
- New forms of signal settings – small added green times
- Testing new features to destruction
- Improved rules for network aggregation

Release(s) of 11.1 post 2011

- 11.1.8 – January 2012
- 11.1.9 – April 2012 (Final General Release)
- 11.1.9A/B/C – Limited releases with one-off corrections … October 2012
- 11.2.1 – Beta release November 2012

11.1 Bugs (E.7)

- P1X double-counts some SLA flows
- SATALL fails with FCF + Q-turns
- SATALL fails with SPIDER + motorway weaves on multiple links
- SATALL – various infrequent crashes corrected
- SATALL - OBA + SPIDER .UFO files are unreliable for later analyses

SATNET (11.2)

- New algorithms for creating SPIDER networks: eg different rules for buffer and simulation links
- AUTNUC increments rather than doubles NUC (less RAM for CFP profiles)
- Increased RAM provided for IN/OUT CFPs

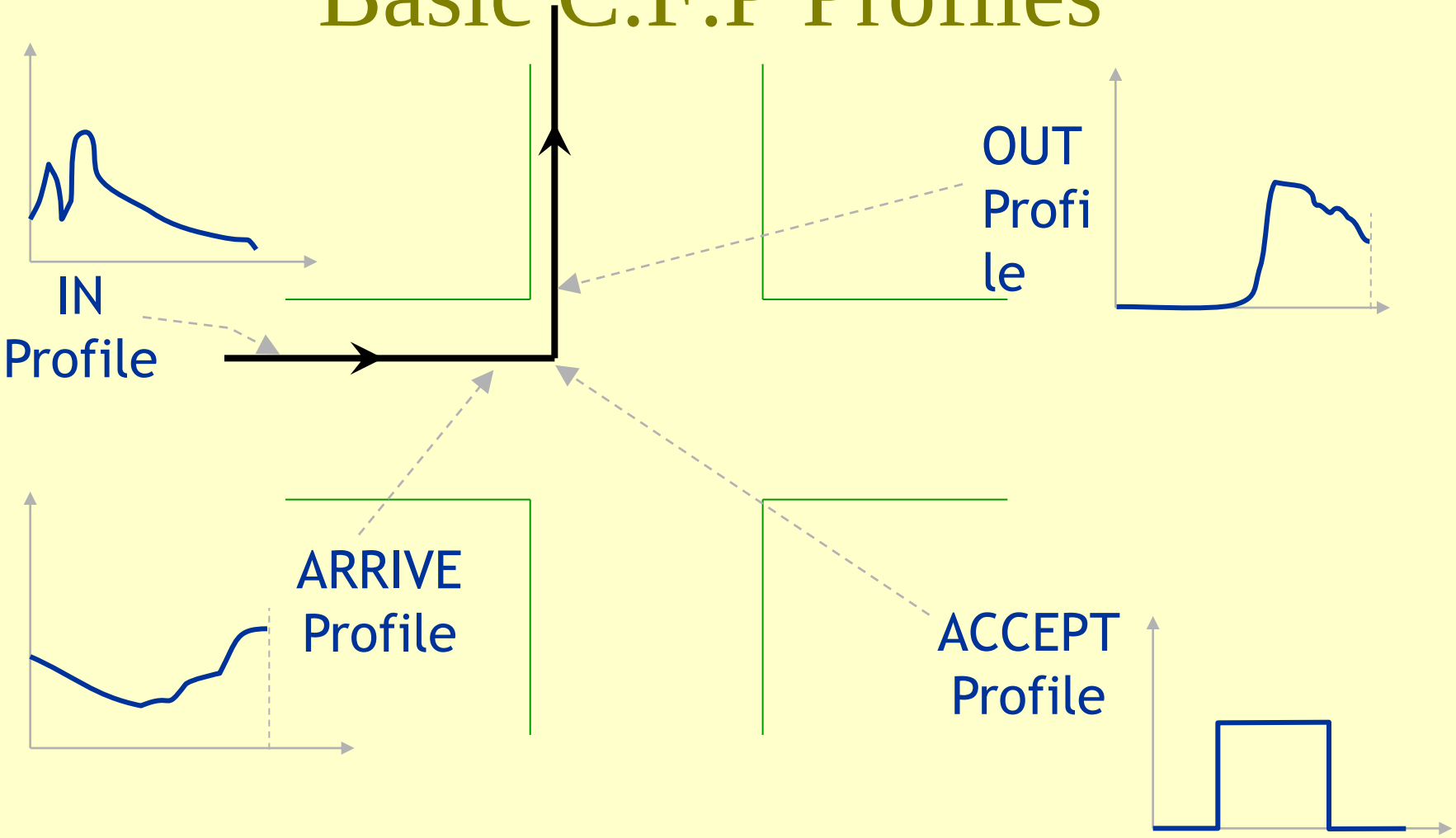
SATALL (11.2)

- SATUFC can work from OBA
- Incremental assignment used under SAVEIT to reduce(?) residual flows
- Various improvements to UFO calculations (discussed later)

Simulation (11.2)

- Small code alterations, in particular flares.
- “Flat” CFPs with NUC = 1 introduced for early iterations for roundabouts and priorities – reduced CPU?
- Combine a flare with a bus lane so that the bus lane setback becomes available for the flared turn

Basic C.F.P Profiles



P1X (11.2)

- Little things mean a lot!
- Choice of .UFO or .UFC to do analyses

MX (11.2)

- Univariate statistics over all matrices in a single table
- M2 comparisons of two levels within the same matrix
- Table of univariate stats over all internal levels
- Selection by level / range of levels.

MX (11.2) How about …

- … UF2CSV mat text LEVEL 3?
- … interactive matrix text dumps set filenames AFTER choice of full/partial matrix?

SATME2 / SATPIJA (11.2)

- SATPIJA counts may use $INCLUDE
- SATME2 based purely on demand flows; i.e., ignores effects of any flow metering on counts

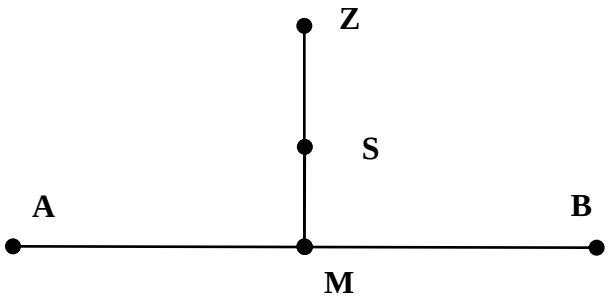
General Changes

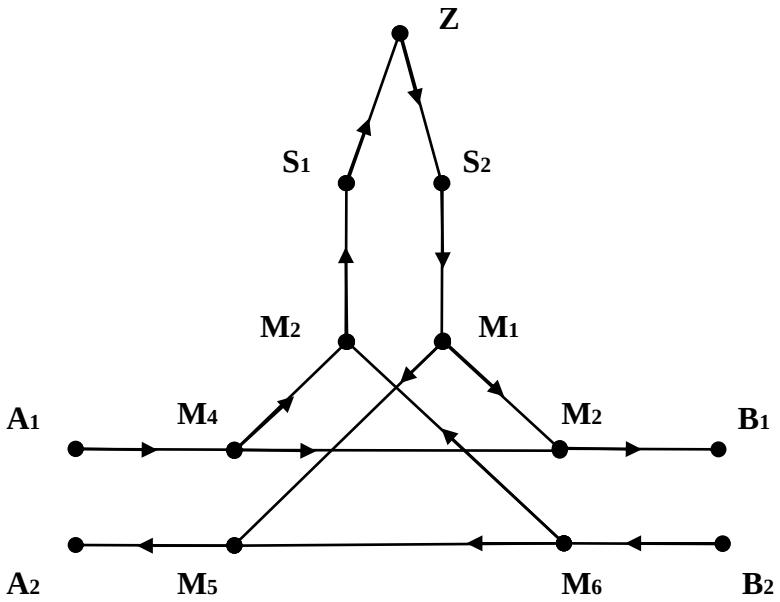
- Allow: SKIMDIST net mat USESPI
- Or: SKIMDIST net mat NOT_USEUFO

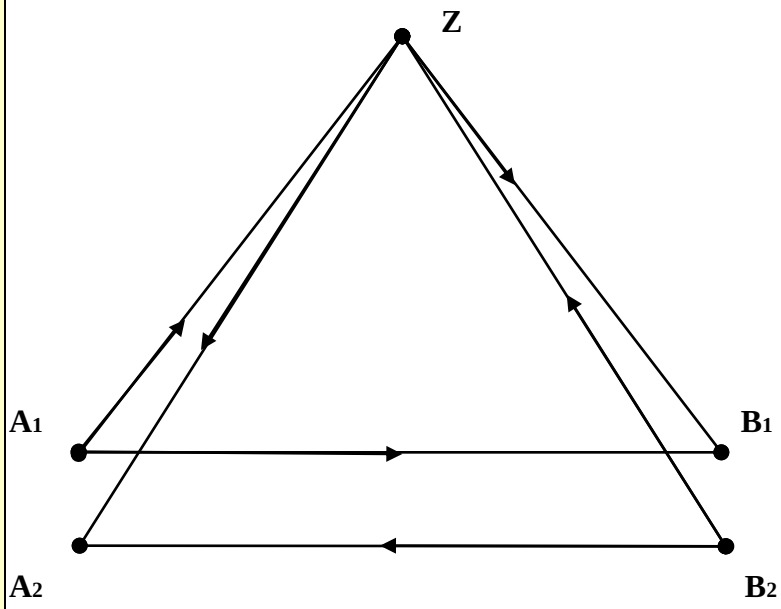
Spider Web Networks

- Aggregate, e.g., chains of links into single links to reduce: (a) total nodes and/or (b) total links and hence total CPU/RAM required to carry out an assignment
- Potential CPU reductions of up to 10 times for assignment, 5 times for assignment plus simulation
- 3 or 4 times faster again with multi-core
- Full release in 11.1, extensions in 11.2

Example of Network Aggregation for 3-Arm Spigot Connector



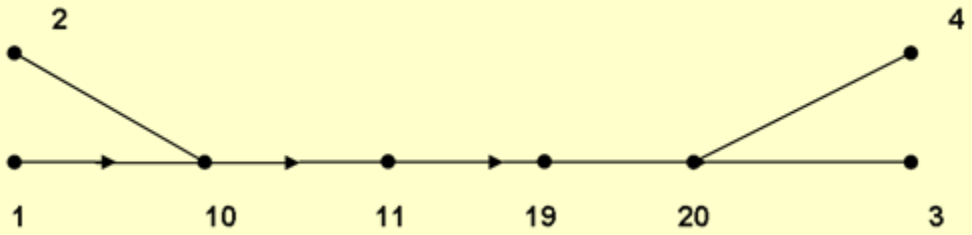




Network Aggregation - 11.2

- Slightly different rules for creating aggregate networks in SATNET
- Priority rules for removing nodes; e.g., within weaves, banned buffer turns
- Exclude aggregate links with zero total flow
- Apply “proportionality rule” to UFO from UFC calculations
- Improved use within skimming

Network Aggregation-Weaving



Network Aggregation – Other New Applications

- Identify flows on multi-node segments
- Turning flows at (aggregated) buffer nodes
- Cordoned matrices for sub-networks within which all nodes are aggregated
- Faster SLA
- Faster SATUFO (= improved hybrid models which shift from FW to OBA)

Uniqueness and Flow Proportionality

- Under Wardrop Equilibrium …
- … OD costs are unique …
- … link costs are unique …
- … total link flows are unique …
- but
- OD path flows are not unique
- UC flows are not unique
- Skimmed time, distance etc. are not unique

Ideas/Objectives: 12/13 (A)

- Accommodate latest DfT advice on multi-class speed-flow
- Bus-lane setbacks modelled as per flares
- SUBUC in SATME2 – subtract nominated UC flows from counts (or SUBVC)
- Further migration to Intel Visual Fortran?

Ideas/Objectives: 12/13 (B)

- Blocking back on 2-arm roundabouts
- More applications to individual levels in **MX** (e.g., Furness)
- Counts A-B-C on non-adjacent nodes to be based on SPIDER links

SATPIJA/ME2 IDEAS

- Counts through multiple nodes, not single links (e.g. blue-tooth vehicle traces)
- Upper/lower limits on cell values
- Run at district-district or sector-sector level
- Use “relaxed convergence” on early SATURN – SATME2 loops (a la CASSINI)
- Distinguish categories of counts: AVC vrs MCC

Training Needs

- Leeds Intro course cancelled due to lack of uptake (financial crisis blah blah blah?)
- Still a need for them
- Possibility of, say, 1-day or 2-day in-house “workshops” with a “trainer” and “trainees”
- Suggestions?

EXIT RANT (To SATURN Users and Atkins)

- Need to think more like modellers ...
- ... And programmers
- More suggestions for incremental changes
- More attention paid to errors
- Go for optimum convergence, not sub-optimal targets
- Warm starts possibly under-used