

Time Based Authorities – selected applications

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Overview

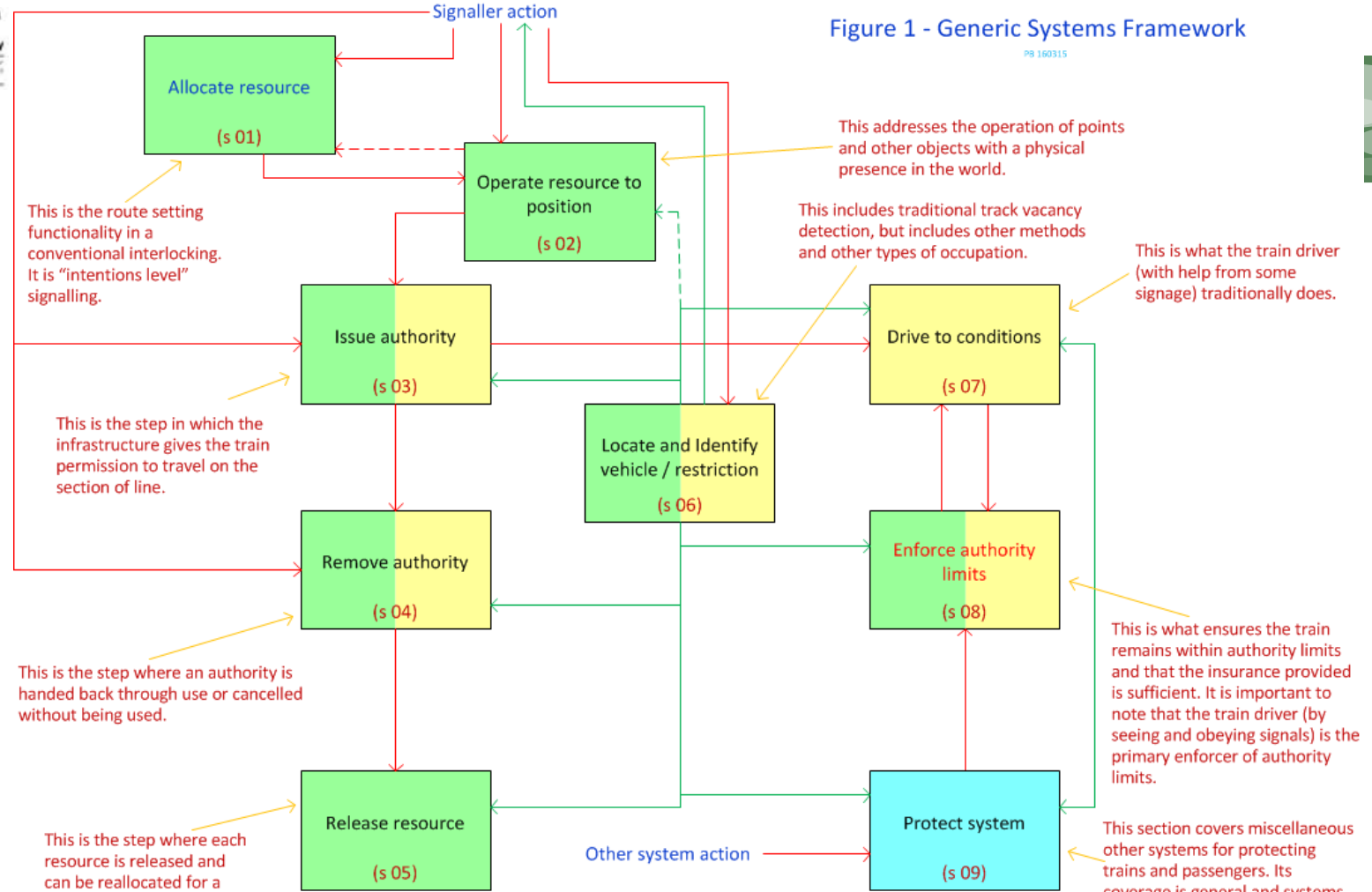


- Context
 - Review authority process
- Location Based Authorities
 - Protection of a worksite
- Protection of trains passing in tunnels
 - A location based approach
 - A time based approach
- Protecting level crossings



Figure 1 - Generic Systems Framework

PB 160315



What is an authority?



- An Authority is a Contract
 - Meeting of Minds
 - Common Understanding: Train v Infrastructure
 - Agreement between parties
 - Identified Train v Identified Infrastructure
 - Formal process
 - A Subject (Scope)
 - **Can be about imposing a restriction**
 - Terms and Conditions
 - The rules of the Rail Authority
 - Special conditions
 - Consideration



Value of view



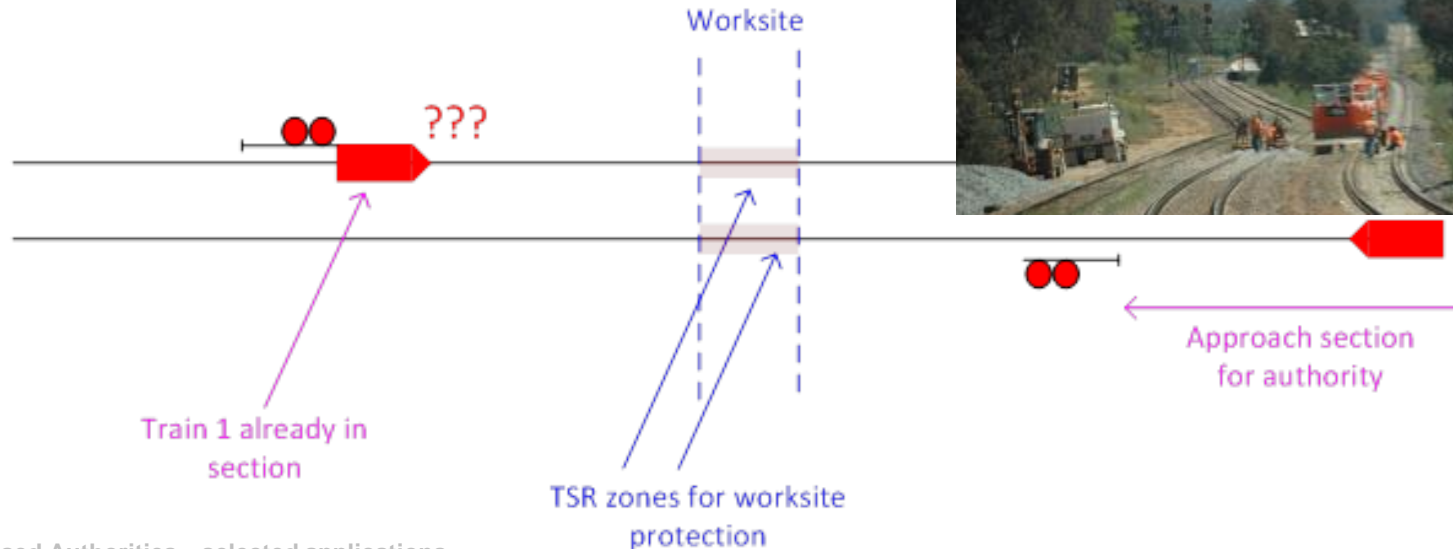
- Contract communication is Vital Communications
 - Where agreement between parties is required
- Extensive literature on what can go wrong
 - More flexible than fixed signals





Protection of a worksite - 1

- Trackforce protection layout
 - Train 1 already entered authority section
 - Train 2 not yet entered authority section



Protection of a worksite - 2



- In practice
 - Use of flaggies and ATWs
 - Pre-warning in weekly notices



Protection of a worksite - 2



- In practice
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Protection of a worksite - 2



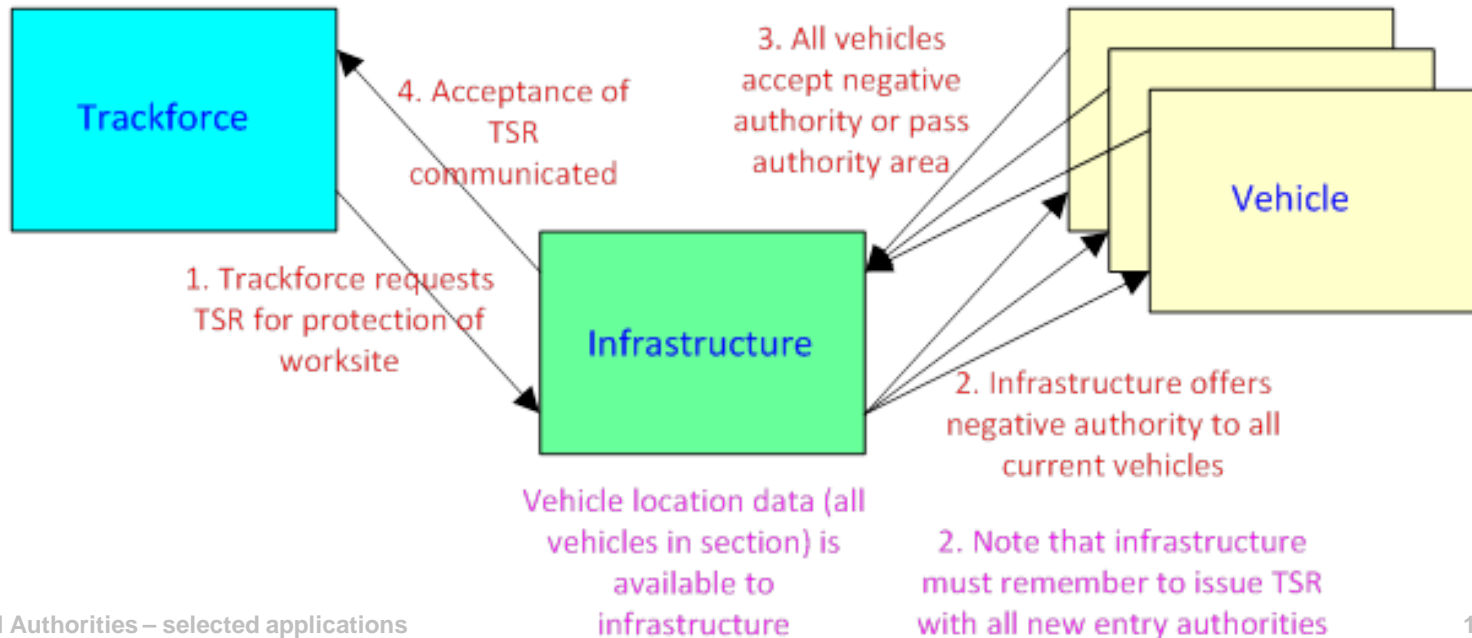
- In practice
 - Use of flaggies and ATWs
 - Pre-warning in weekly notices





Protection of a worksite - 3

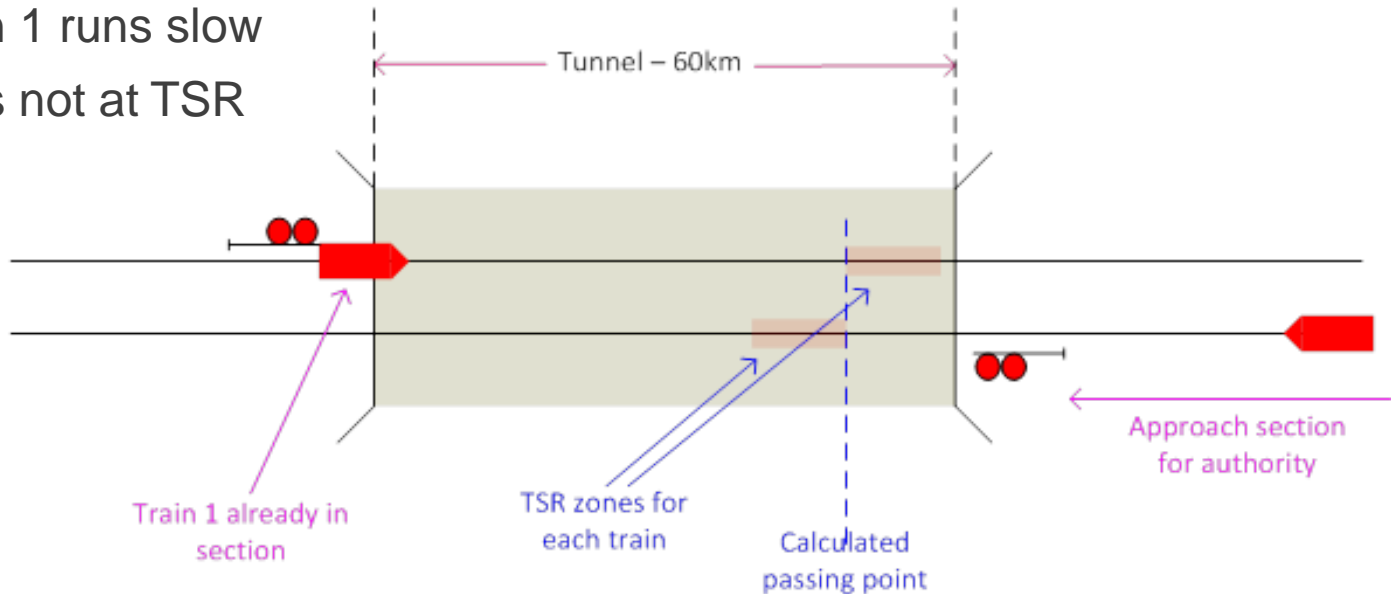
- The Trackforce authority formal process
 - Establishing a temporary speed restriction



Tunnel passing authorities - 1



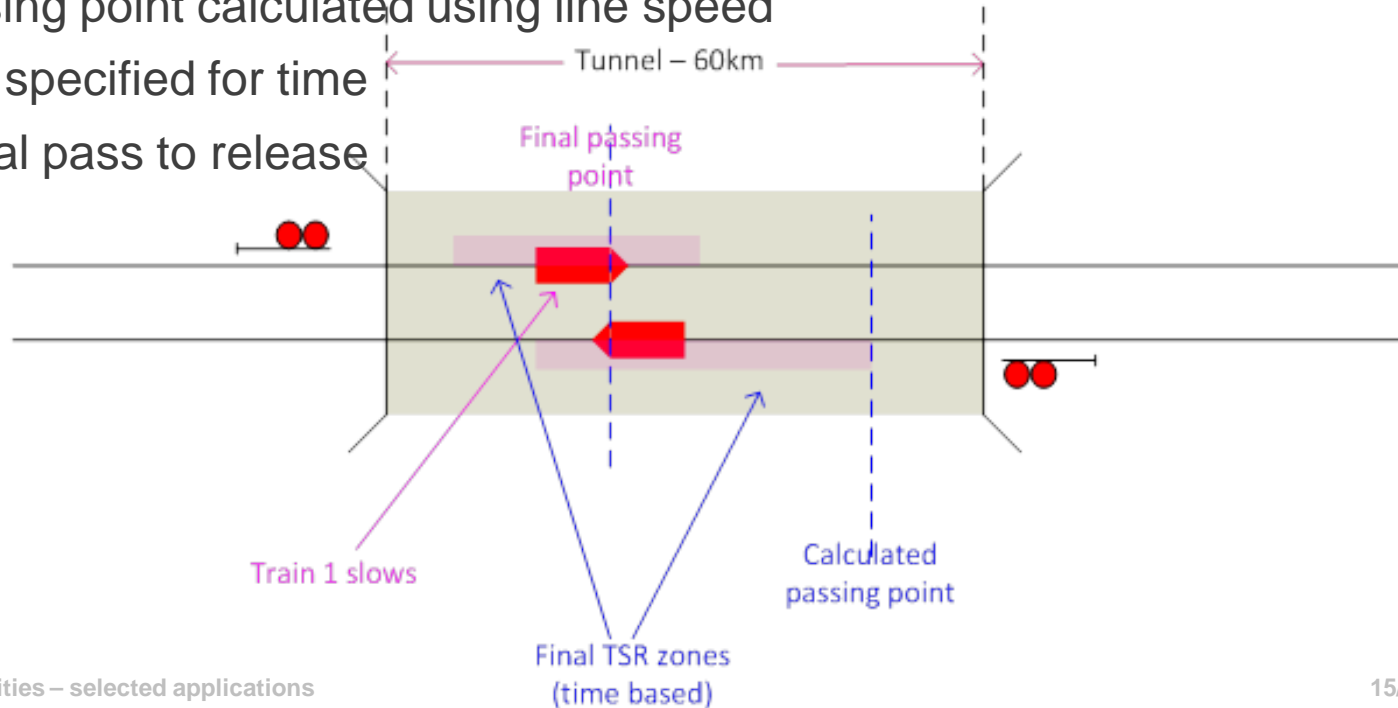
- Location based authority
 - Passing point calculated using line speed
 - Train 1 runs slow
 - Pass not at TSR



Tunnel passing authorities - 2



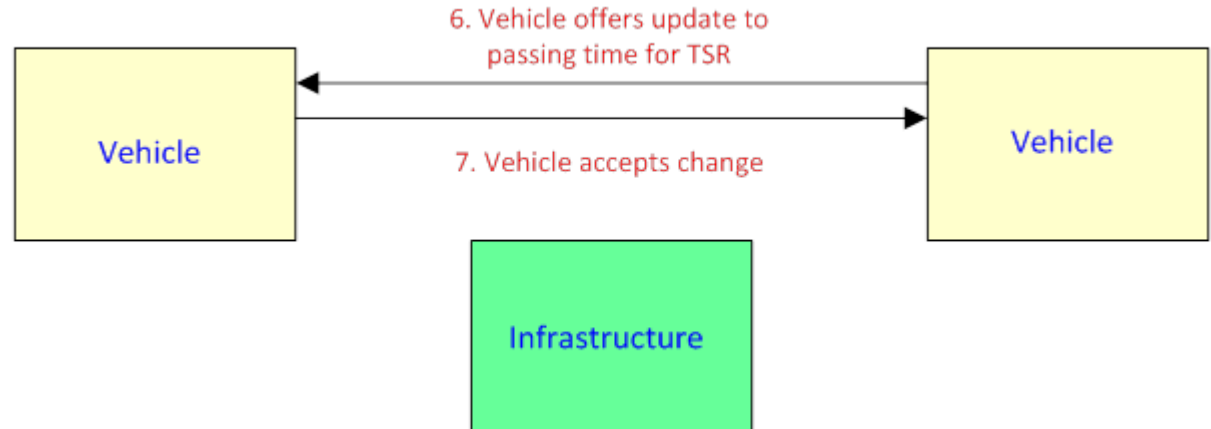
- Time based authority
 - Passing point calculated using line speed
 - TSR specified for time
 - Actual pass to release



Tunnel passing authorities - 3



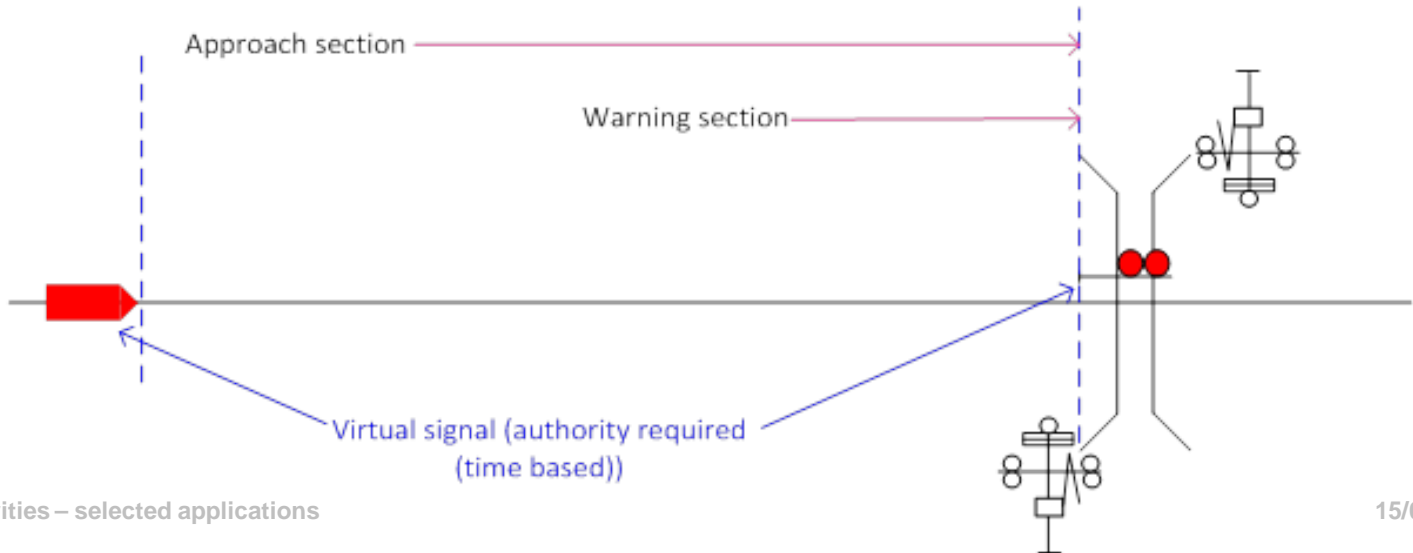
- Time based authority formal process
 - Initially the same as for worksite protection
 - Passing authority must be in place before tunnel entry authority
 - Authority updates as trains approach each other
 - Vehicle to vehicle (infrastructure as agent)
 - Failsafe



Level crossing time based authority - 1



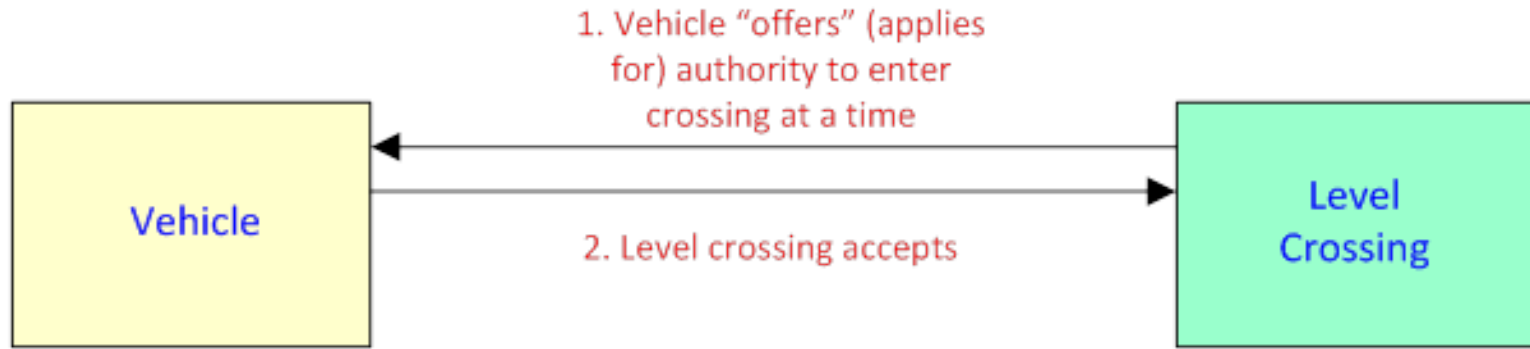
- Context of train approaching crossing
 - Standard warning time required for road traffic
 - Train can cross if booms are lowered
 - Failsafe (with time based authority)



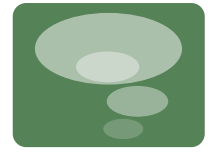


Level crossing time based authority - 2

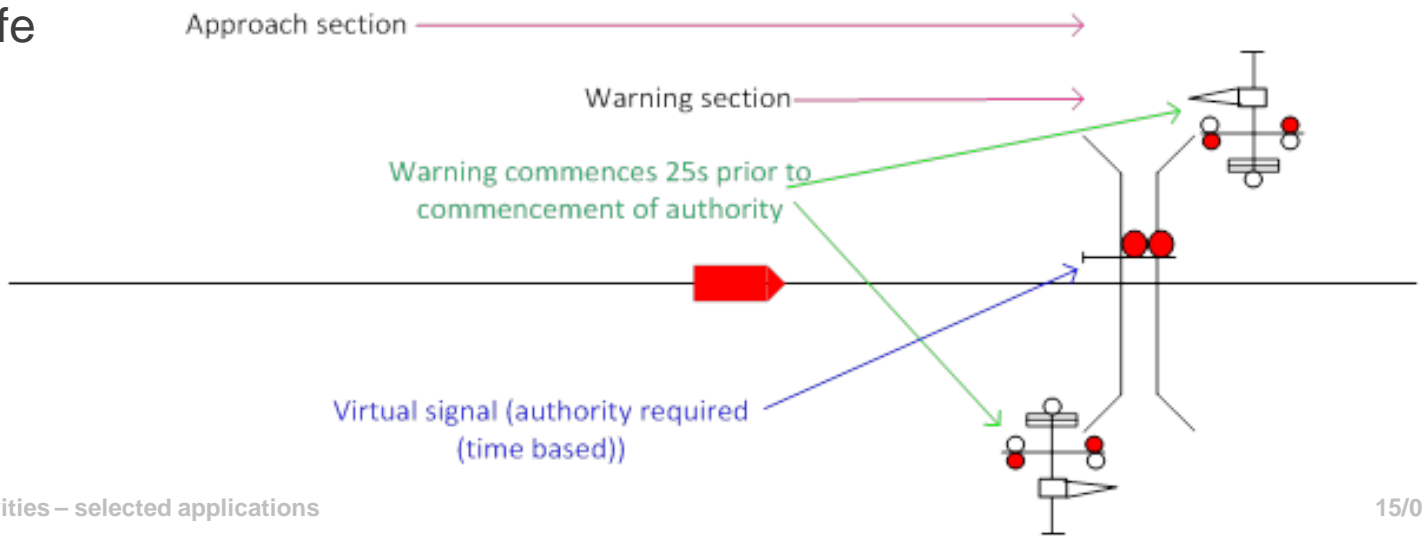
- Formal authority process
 - Vehicle obtains authority to cross at specified time
 - Authority (time based) is enforced by the vehicle
 - Authority may be updated as train approaches crossing
 - Failsafe



Level crossing time based authority - 3



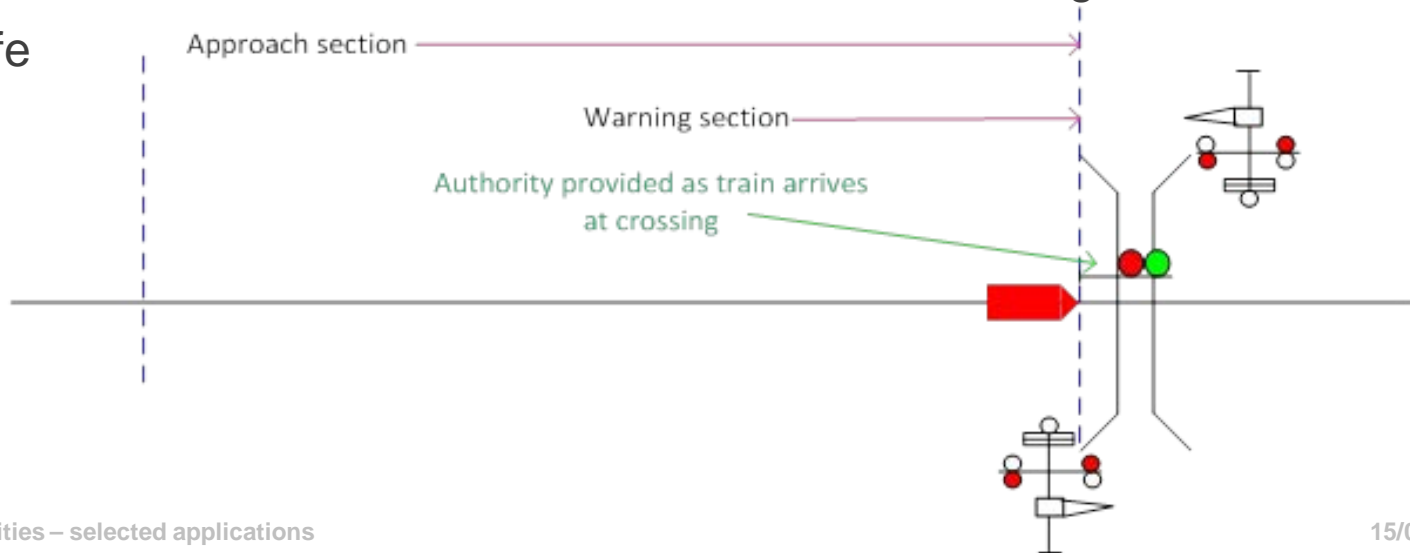
- Warning commences as train approaches crossing
 - Warning commences 25s prior to authorised crossing time
 - Vehicle enforces arrival time but continues at planned speed
 - *Virtual signal remains at danger until authorised time*
- Failsafe



Level crossing time based authority - 4



- Train arrives at crossing
 - *Virtual signal goes to proceed to authorise crossing*
 - Vehicle arrives at crossing at planned speed
 - Protection ceases when vehicle detected clear of crossing
 - Failsafe



Conclusion



- Time based authorities variants are today's technology
 - Supported by ECTC (as add-on)
 - Supported by ATACS
- Benefits in adoption of approach
 - Lower cost
 - Improved safety
- Signalling functions move on board train



Questions?



- <http://pybconsulting.com.au>