November Meeting

11/13/2024

AGENDA

1. Announcements
2. Roads & Highways Updates - Nathan Easley
3. Everything New in the 3.4/11.4 Release - Nathan & Team
4. Open Discussion

ANNOUNCEMENTS

- GeoNet - Become a part of the ESRI Community
  - https://community.esri.com/t5/roads-and-highways-user-group-rhug/gh-p/roads-and-highways-user-group-rhug

- We are always looking for presentation volunteers

Roads & Highways Updates

Nathan Easley

Roads & Highways 3.4 / 11.4 Releases - What to Know About Everything New

Nathan Easley & Team

Open Discussion

- For RHUG members/DOTs planning to move to RnH from a non-Esri system we were wondering if other RHUG members/DOTs would be willing to demonstrate the following two topics at a future RHUG meeting or please speak up (ask to be taken off mute) or put your comments in chat.

  - Managing local public road miles that are included in ARNOLD but for which locations aren't certain, how do states manage these bulk totals? Esri told us about two states doing this… maybe there are others?

    - Idaho's "tabulated roads"
    - Michigan's "ghost roads"

Open Discussion

- We know that RnH is time-enabled, and we are looking for additional information about:
  - How are agencies sharing history from before they started RnH?
    - How do customers "translate" between old and new?
  - How are agencies sharing changes from after they started RH?
    - System snapshots, change summaries?
    - What period of change is described: weekly, monthly, annual?

Open Discussion

- Experience Builder as Event Editor Replacement
  - Cannot edit and apply events in the attribute table
    - ESRI aware of issue and aiming for fix in 3.5/11.5 release

Upcoming Meetings / Contacts

Wednesday December 11th, 12:30-2pm

Contact Info:

Erin Lesh ealesh@ncdot.gov

Patrick Whiteford pwhiteford@azdot.gov

Ryan Koschatzky rjkoschatzky@ncdot.gov

Shaun Perfect sperfect@azdot.gov

Capabilities currently under development

- **Consider route dominance in Append Events GP tool**

- **International Miles measure method**

- **Create LRS with existing centerline for Addressing support**

- **Update Measures from LRS**
  - Populate Route Name when configured
  - Allow LRS Events and Intersections to be updated
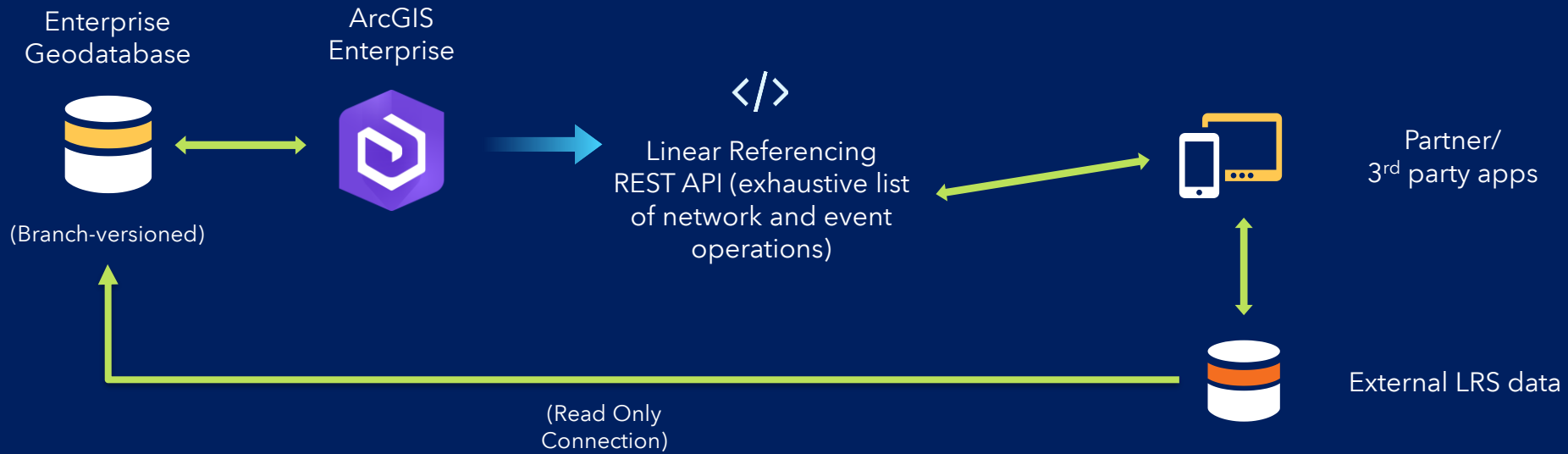
Support Incidents/Defects

- **BUG-000171779** – When Realign Route is run on a LRS dataset created with a Geographic Coordinate System, the measure after the Realign does not appear to be updating correctly and the Calibration Point does not update (fixed in 3.4/11.4)

- **BUG-000170566** – When running the Apply Event Behaviors tool with the Event Realign rule set to Cover, the FromDates appear to be incorrectly set to the date of the realignment (fixed in 3.5/11.5)

- **BUG-000171081** – Unable to add calibration points to LRS route when it has a Null From Date (fixed in 3.5/11.5)

- **BUG-000171206** – Realign Route fails with error: "There was an error while processing the edits on the server" (fixed in 3.5/11.5)

- **BUG-000171560** – ArcGIS Pro crashes if you rename a LRS feature class (ex. Centerline, Calibration Point, Redline, Centerline Sequence) and then try to use the Modify LRS geoprocessing tool (fixed in 3.5/11.5)

- **BUG-000171243** – Using the Explore functionality from the Map Tab after attempting to add calibration points to an LRS dataset results in an ArcGIS Pro crash (fixed in 3.5/11.5)
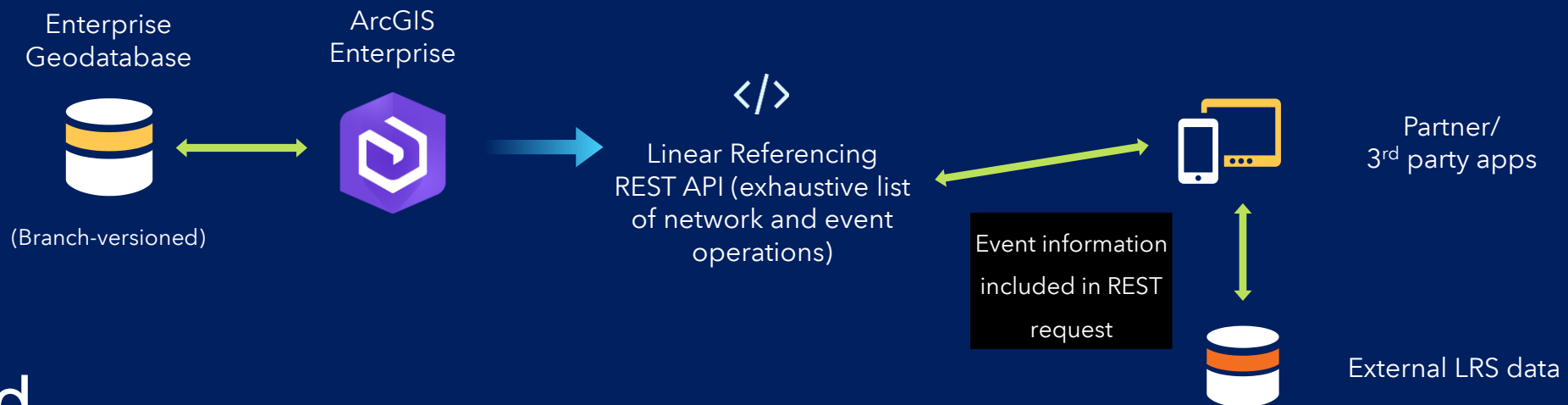
Other Announcements

- **Pro 3.4 now available (Enterprise 11.4 available later this month**

- **Patches/Hot fixes**
    - **Planning underway for a Roads and Highways for Server 11.3 patch**
    - **Would release in conjunction with Pro 3.3.3 in early 2024**

- **Design discussions**

Modernizing External System Integration

Current

Enterprise Geodatabase (Branch-versioned) — ArcGIS Enterprise — Linear Referencing REST API (exhaustive list of network and event operations) — Partner/3rd party apps — External LRS data

(Read Only Connection)

Updated

Enterprise Geodatabase (Branch-versioned) — ArcGIS Enterprise — Linear Referencing REST API (exhaustive list of network and event operations) — Partner/3rd party apps — External LRS data

Event information included in REST request

Goals

- **Create new External Event registration GP tool that removes connection file requirements**

- **Extend Relocate Events operation to support a new pattern where event data can be provided in the request**

- **Maintain backwards compatibility**

- **Ensure clarity for users to understand all supported patterns**

Three patterns for external event data

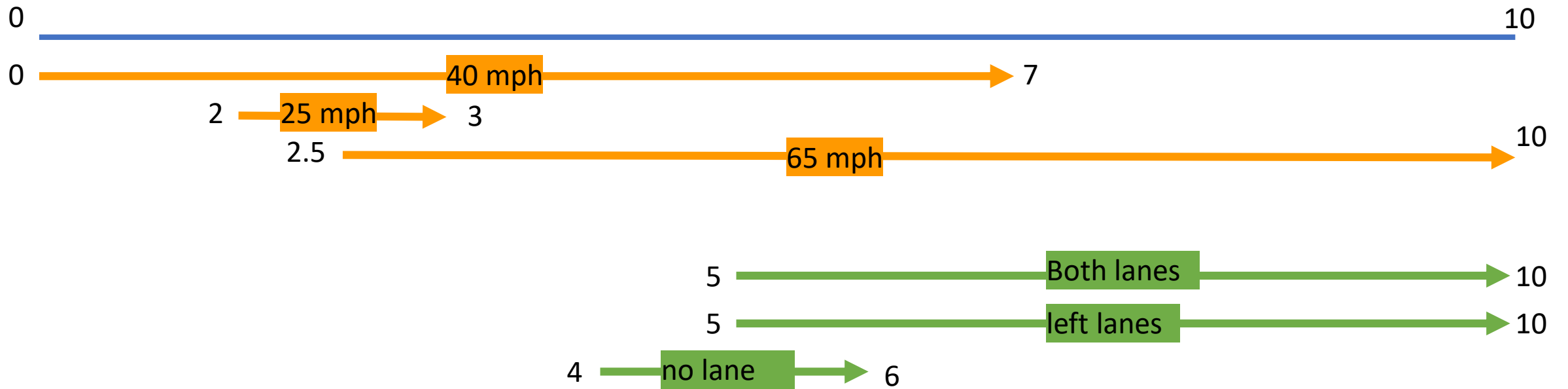| Connection File pattern	Hybrid pattern	Services Only pattern
• **Current pattern**	• **No connection file**	• **No connection file**
• **External Event is configured with LRS**	• **External Event is configured with LRS**	• **Event Behaviors required in the Relocate Events request**
• **Requires connection file**	• **No connection file**	• **Two additional parameters required in Relocate Events**
• **Fewest parameters required in Relocate Events operation**	• **Event Behaviors are only populated once**	• **Event Behaviors can be easily changed if needed**
• **All events impacted by route edits are processed**	• **One additional parameter required in Relocate Events**	• **User controls which events are processed**
	• **User controls which events are processed**	

- Support Overlay Events (GP), Query Attribute Sets (REST), and DynSeg to work with overlapping events.

- The following slides have an example of overlapping events on a route, and 3 approaches on how the results could be shown in the table. Let's choose one.

0   10

0 ──────────────── 40 mph ────────────────▶ 7

2 ── 25 mph ──▶ 3

2.5 ──────────── 65 mph ────────────────▶ 10

5 ──────────── Both lanes ────────────────▶ 10

5 ──────────── left lanes ────────────────▶ 10
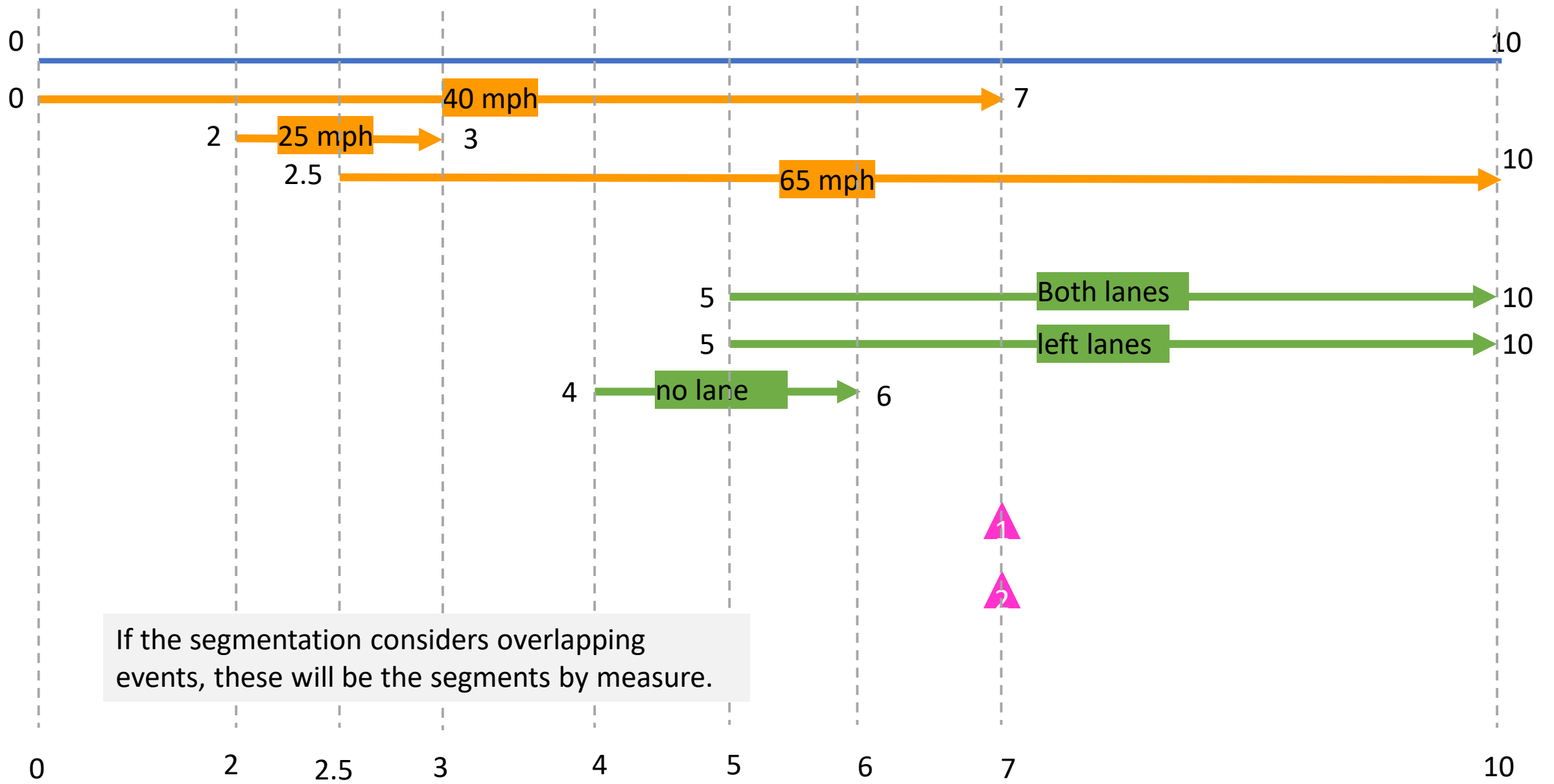
4 ── no lane ──▶ 6

The route in blue goes from 0 to 10.

There are 3 Speed Limit events overlapping with each other.

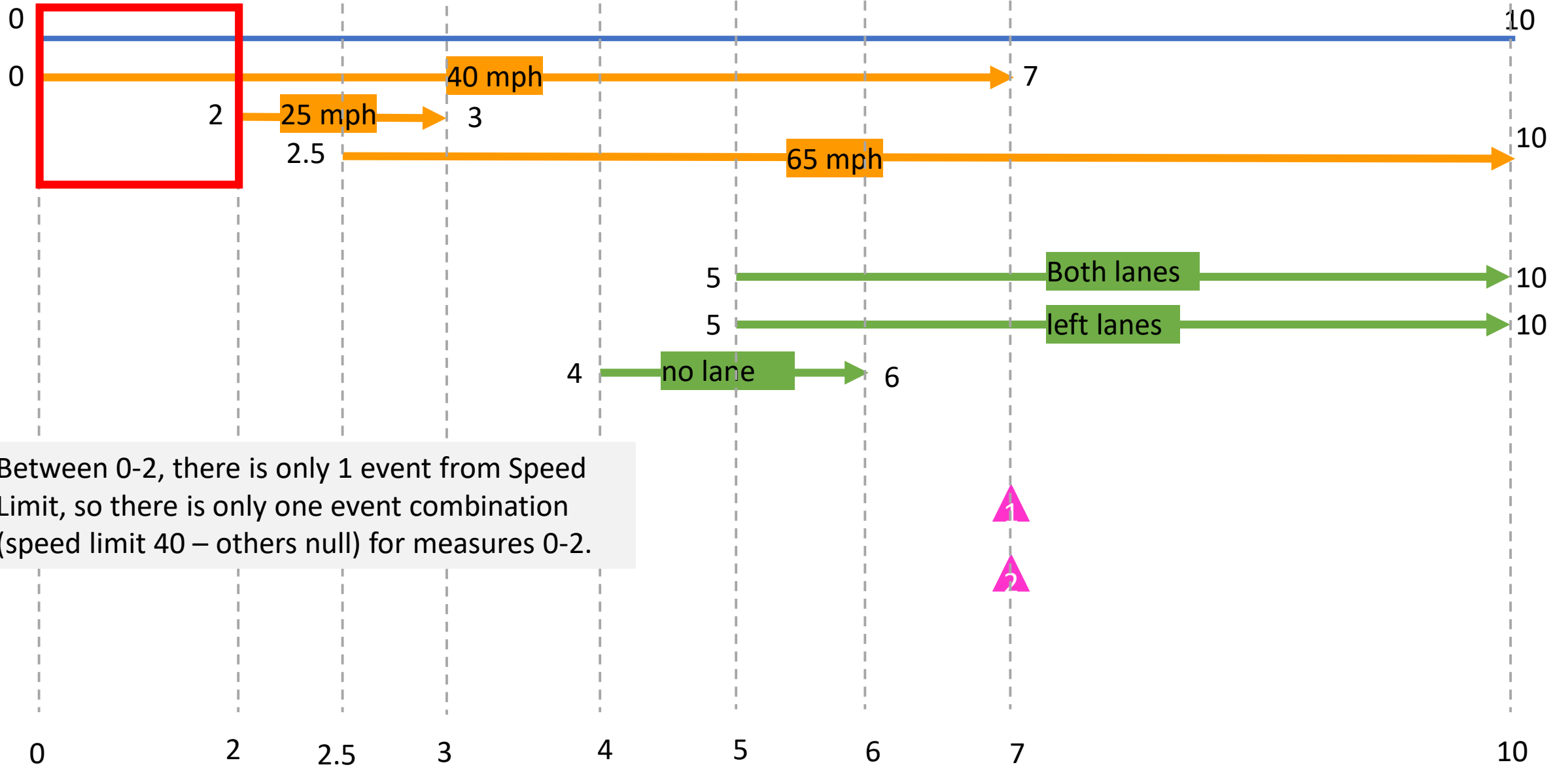There are 3 Lanes events in green overlapping with each other.

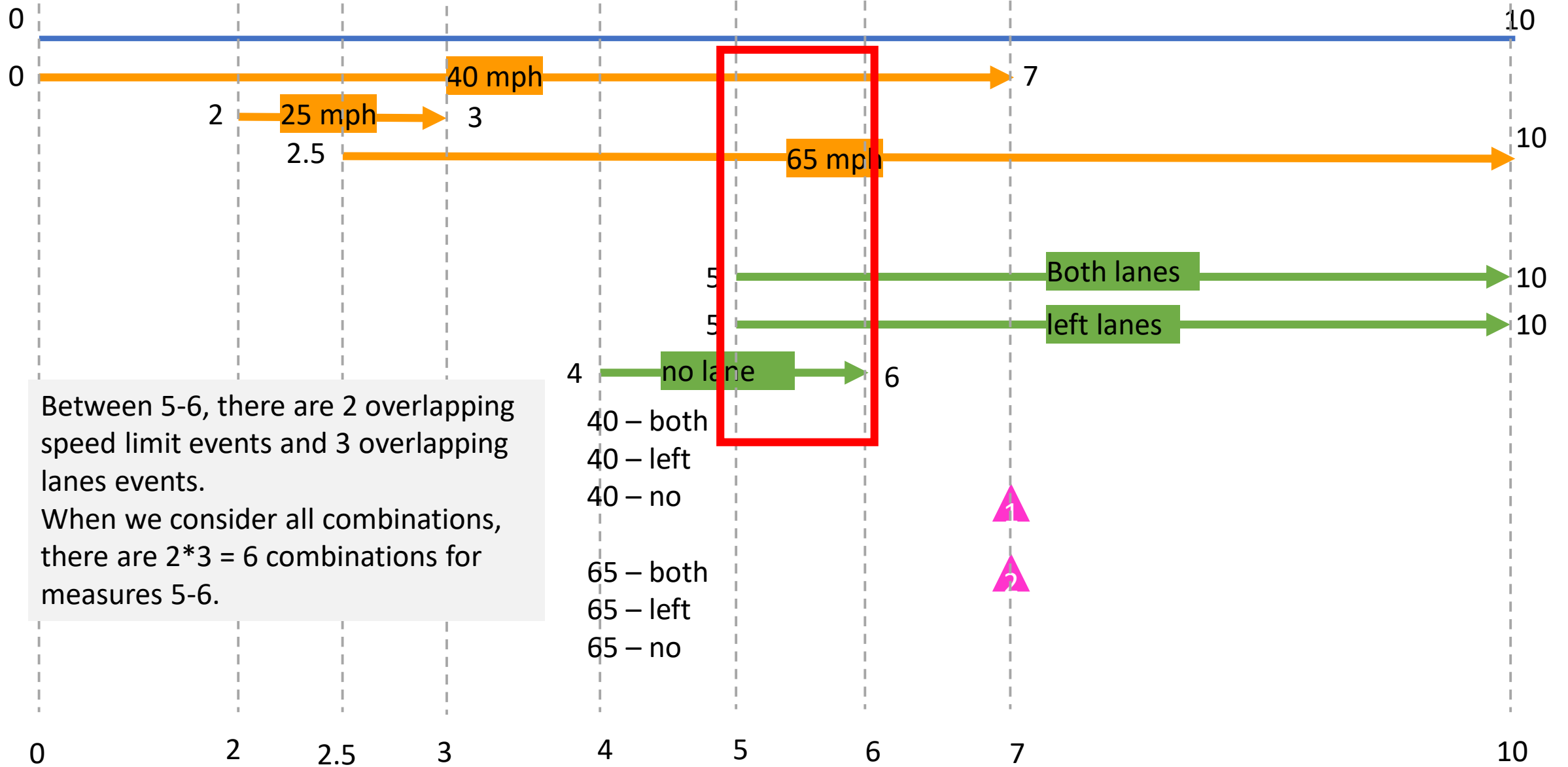There are 2 Crash point events overlapping at measure 7.

1

2

0								10

0 — 40 mph — 7

2 — 25 mph — 3

2.5 — 65 mph — 10

5 — Both lanes — 10

5 — left lanes — 10

4 — no lane — 6

1

2

If the segmentation considers overlapping events, these will be the segments by measure.

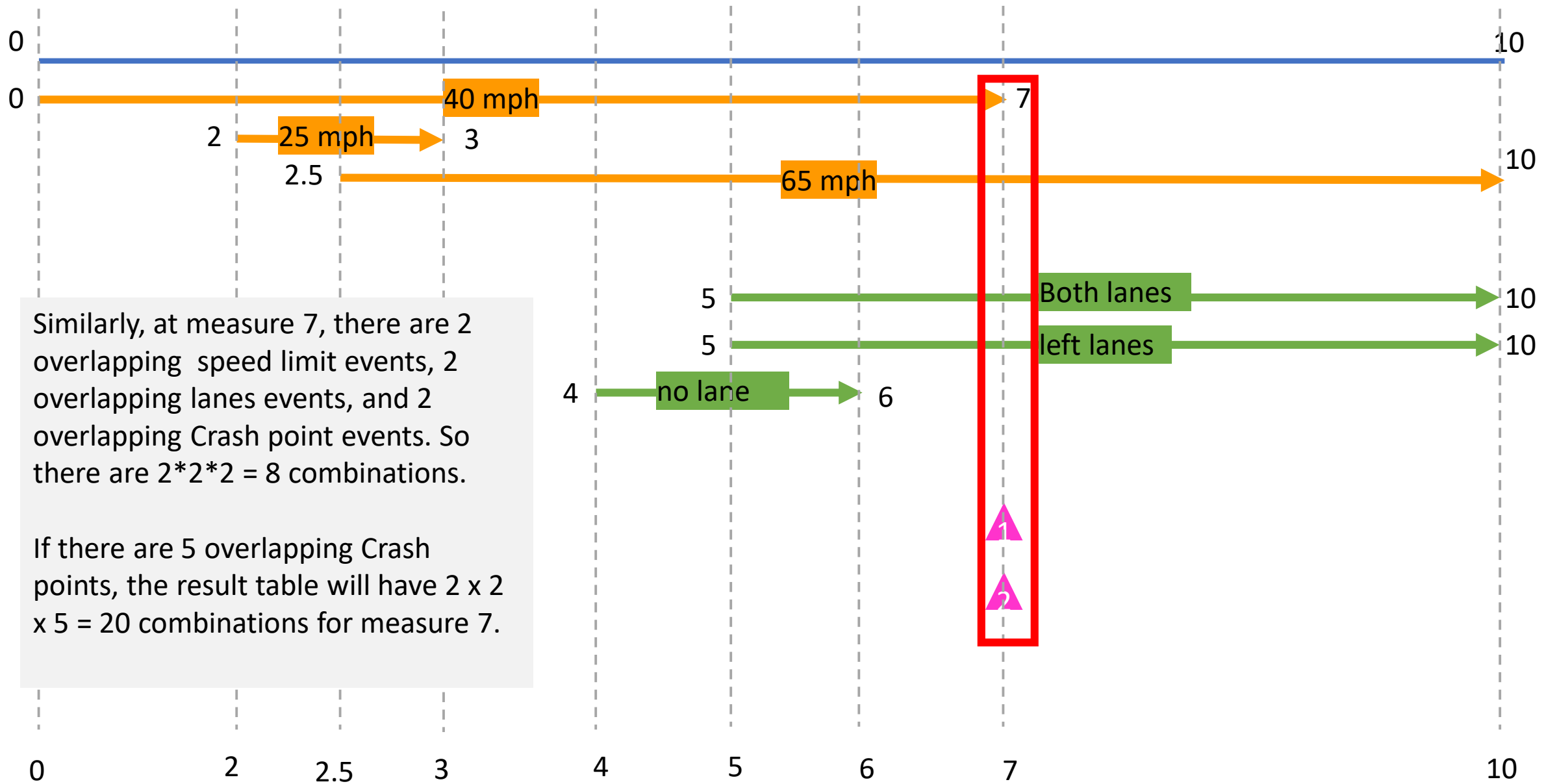| 0		2	2.5	3		4	5	6	7			10

"Extra Rows" approach

- In this approach, all combinations of existing events are listed for each segment. E.g. between measures 5 and 6, there are many combinations, and they form multiple rows in the result table. This is where the name "Extra Rows" comes from.

- The following slides have examples of overlapping events combinations.

Between 0-2, there is only 1 event from Speed Limit, so there is only one event combination (speed limit 40 – others null) for measures 0-2.

Between 5-6, there are 2 overlapping speed limit events and 3 overlapping lanes events.
When we consider all combinations, there are 2*3 = 6 combinations for measures 5-6.

40 – both
40 – left
40 – no

65 – both
65 – left
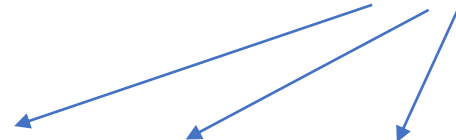65 – no

"Extra Rows" approach

Pro:
The more overlapping events there are, the more rows the table has. In comparison, the number of columns is set.

Con:
The combinations in rows might be difficult to understand.

From Measure	To Measure	Type	SpeedLimit	LanesDirection	Crash
0	2	Line	40 mph	null	null
2	2.5	Line	40 mph	null	null
2	2.5	Line	25 mph	null	null
2.5	3	Line	40 mph	null	null
2.5	3	Line	25 mph	null	null
2.5	3	Line	65 mph	null	null
3	4	Line	40 mph	null	null
3	4	Line	65 mph	null	null
4	5	Line	40 mph	no	null
4	5	Line	65 mph	no	null
5	6	Line	40 mph	left	null
5	6	Line	40 mph	both	null
5	6	Line	40 mph	no	null
5	6	Line	65 mph	left	null
5	6	Line	65 mph	both	null
5	6	Line	65 mph	no	null
6	7	Line	40 mph	both	null
6	7	Line	40 mph	left	null
6	7	Line	65 mph	both	null
6	7	Line	65 mph	left	null
7	7	Point	40 mph	both	1
7	7	Point	40 mph	both	2
7	7	Point	40 mph	left	1
7	7	Point	40 mph	left	2
7	7	Point	65 mph	both	1
7	7	Point	65 mph	both	2
7	7	Point	65 mph	left	1
7	7	Point	65 mph	left	2
7	10	Line	65 mph	both	null
7	10	Line	65 mph	left	null

"Extra Columns" approach

From Measure	To Measure	Type	SpeedLimit_1	SpeedLimit_2	SpeedLimit_3	LanesDirection_1	LanesDirection_2	LanesDirection_3	Crash_1	Crash_2
0	2	Line	40 mph	null	null	null	null	null	null	null
2	2.5	Line	40 mph	25 mph	null	null	null	null	null	null
2.5	3	Line	40 mph	25 mph	65 mph	null	null	null	null	null
3	4	Line	40 mph	null	65 mph	null	null	null	null	null
4	5	Line	40 mph	null	65 mph	no	null	null	null	null
5	6	Line	40 mph	null	65 mph	no	both	left	null	null
6	7	Line	40 mph	null	65 mph	null	both	left	null	null
7	7	Point	null	null	65 mph	null	both	left	1	2
7	10	Line	null	null	65 mph	null	both	left	null	null

Pro:

The more overlapping events there are, the more columns the table has. In comparison, the number of rows is set. It's also easier to understand what happens at each segment as there is no "event combination".

Con:

The horizontal size is controlled by # of overlapping events and it can grow huge.

- E.g. at 1 location on the route, there are 7 overlapping Pavement Condition events. This event has 25 attribute fields, which means the entire table will have 7*25 = 175 columns for pavement, plus columns for other events and fields.
- And since there is only 1 location where 7 Pavement events overlap, for most cells in the result table, the value is null.

Extra Values –

Pro:
No extra row or column. Very easy visualization.

Con:
But in Dynseg tool, event values are editable and they pass back to original events.
In this approach, **cells cannot be editable.**

From Measure	To Measure	Type	SpeedLimit	LanesDirection	Crash
0	2	Line	40 mph	null	null
2	2.5	Line	40 mph; 25 mph	null	null
2.5	3	Line	40 mph; 25 mph; 65 mph	null	null
3	4	Line	40 mph; 65 mph	null	null
4	5	Line	40 mph; 65 mph	no	null
5	6	Line	40 mph; 65 mph	no, both; left	null
6	7	Line	40 mph; 65 mph	Both; left	null
7	7	Point	65 mph	Both; left	1; 2
7	10	Line	65 mph	Both; left	null

Which one is the best for your organization?

	Pros	Cons
Extra Rows	The number of columns is fixed. The table doesn't grow too wide. Editable in Dynseg.	More overlapping events means more rows. The combinations in rows can be difficult to understand.
Extra Columns	The number of rows is fixed. The table doesn't grow too tall. Easier to understand when 1 row = 1 segment. Editable in Dynseg.	More overlapping events means more columns, especially when events have many fields. When events have many fields, there will be lots of <Null>s where not all overlapping events exist.
Extra Values	Minimizes the number of rows and columns.	Non editable in Dynseg.

https://community.esri.com/t5/roads-and-highways-user-group-rhug-questions/rhug-working-groups/m-p/1376970
from Koschatzky, Ryan J to Everyone
12:32

https://community.esri.com/t5/roads-and-highways-user-group-rhug/gh-p/roads-and-highways-user-group-rhug
from David Runneals, Cultivate Geospatial to Everyone
12:36

11.4 is out
from Nicole Hanson to Everyone
12:37

2024? do you mean 2025??
from Troy Marsh to Everyone
12:38

11.4 is officially out and available for download
from Amelia Dieken to Everyone
12:41

Audio is cutting in and out a lot. Is this just me?
from Ethan Pointer Ohio DOT to Everyone
12:41

Sounds fine to me
from Oregon DOT to Everyone
12:41

Our connection is clear
from Alex Carter to Everyone
12:41

Sounds fine to me
from Bryan Mass to Everyone
12:41

it is fine for me
from Ethan Pointer Ohio DOT to Everyone
12:48

Enhanced documentation on external events will be greatly appreciated
from Kevin Hunt to Everyone
12:50

On a future meeting it would be interesting to hear how many in the RHUG community are working with external events. NYSDOT only has external events with our AgileAssets EAM system. And the AgileAssets system requires use of the Export Network REST endpoint as well.
from Patrick Kemble to Everyone
12:56

Points are supported in all three, including dyn seg?
from Clive Reece to Everyone
12:56

Yes
from Nathan Easley to Everyone
12:56

Yes Patrick, we added point support to dynamic segmentation at 3.4/11.4. We will be demoing later.
from Patrick Kemble to Everyone
12:57

Nice, thanks.
from Kevin Hunt to Everyone
12:59

The overlapping events in Claire's example are confusing me. Are these overlapping event records in the same event feature class or something else.?
from Adrien Litton to Everyone
13:00

It looks like they're overlapping in different event layers and aggregated into some new table for... reasons?

from Dave DiNocco to Everyone

13:02

Will there be the ability to toggle on or off the new overlay method?

from Mike Clement-IowaDOT to Everyone

13:02

In Iowa we are most used to working with data in the 'Extra Columns" mode but we do have use cases where we use "Extra Rows". We would prefer to have both of those options supported

from Adrien Litton to Everyone

13:03

The example show 3 events in one table. We wouldn't have speed limit, lanes, and crashes in the same event.

from Patrick Kemble to Everyone

13:04

Kevin, we don't use overlapping data in the same event class, correct, so this would not apply to us?

from Koschatzky, Ryan J to Everyone

13:04

Getting triggered with the QC overlap errors. :) Not sure which method would help to QC better.

from Kevin Hunt to Everyone

13:04

Thanks Nathan. I'm trying to imagine an event layer where overlapping events is desired rather than just an error. Can someone in the community help with a real world example?

from Ting Wang - Trimble to Everyone

13:05

Kevin - data from different years maybe

from Nicole Hanson to Everyone

13:05

Our speedzones has overlapping

from Shaun Perfect to Everyone

13:05

speed limits

from Elsit Mandal to Everyone

13:05

pavement layers actually overlapping

from Mike Clement-IowaDOT to Everyone

13:05

we have overlapping events in our Route Name layer

from Nicole Hanson to Everyone

13:05

And our SHS event - bc of the route concurrencies for that event

from Adrien Litton to Everyone

13:06

The poll disappeared while still trying to understand the concept. Can you put it up again?

from Kevin Hunt to Everyone

13:06

Ok, thank you! I don't think I should get a vote on this. but I'm thinking about it....

from Shaun Perfect to Everyone

13:06

Vote Kevin

from Ethan Pointer Ohio DOT to Everyone

13:06

you might have to close your chat to see the poll

from Nicole Hanson to Everyone

13:06

Vote for what I want Kevin!

from Adrien Litton to Everyone

13:06

Got it. Thanks.

from Nicole Hanson to Everyone
13:06
I like the extra rows :)
from Oregon DOT to Everyone
13:06
Rows or Columns, not C.
from Yueming Wu to Everyone
13:07
I agree with Nicole.
from Yueming Wu to Everyone
13:07
I voted "Extra Rows"
from Mohla, Kathleen@DOT to Everyone
13:07
No Extra values.
from Mike Clement-IowaDOT to Everyone
13:08
using extra rows only will make it harder to do mileage summary reports based on the dynseg output. You'd get the same mileage counted multiple times so you'd need to do some work to make sure your only counting each segment once if that is what you are after
from Kevin Hunt to Everyone
13:08
Ha ha. I am officially overwhelmed.

will make it harder to do mileage summary reports based on the dynseg output. You'd get the same mileage counted multiple times so you'd need to do some work to make sure your only counting each segment once if that is what you are after
from Kevin Hunt to Everyone
13:08
Ha ha. I am officially overwhelmed.
from Marisa Mailand to Everyone
13:13
When I was in MT we had overlapping Construction Project IDs from different years. In that case we would want the most recent one in dyn seg.
from Adrien Litton to Everyone
13:13
This is really nice!
from Patrick Kemble to Everyone
13:19
So this is kind of like an LRS Event pivot table
from Nicole Hanson to Everyone
13:29
This is amazing!
from Adrien Litton to Everyone
13:30
It only took 14 years but we finally have an SLD :).
from Mohla, Kathleen@DOT to Everyone
13:31
Thank you Esri for the demos. Need to drop for another meeting.
from Aaron Ferrari WVDOT to Everyone
13:32
How could we get intersections in this SLD widget? Would we need a point event to do so?
from Nicole Hanson to Everyone
13:32
Yes Yes yes!
from Aaron Ferrari WVDOT to Everyone

13:32
Can you add text labels to point events like you have configured for line events?
13:32
Can you add text labels to point events like you have configured for line events?
from Nicole Hanson to Everyone
13:34
Is it possible to have the SLD as a view only (not being able to edit)
from Yueming Wu to Everyone
13:34
Can we share the url link with someone else with the location and event values included?
from Ethan Pointer Ohio DOT to Everyone
13:35
Will this be available as a template?
from Aaron Ferrari WVDOT to All panelists
13:36
Yes, intersections are the biggest roadblock keeping our field crews from switching from paper to digital SLDs.
from Aaron Ferrari WVDOT to All panelists
13:36
Thank you!
from Koschatzky, Ryan J to Everyone
13:36
How does this work in corouted sections and route dominances?
from Ben Bouchard to Everyone
13:37
Is it possible to export the SLD as a pdf or image file?
from Yueming Wu to Everyone
13:38
yes, that's what I meant
from Ethan Pointer Ohio DOT to Everyone
13:38
You have a couple alrady with the LRS tools
from Aaron Ferrari WVDOT to All panelists
13:36
Yes, intersections are the biggest roadblock keeping our field crews from switching from paper to digital SLDs.
from Aaron Ferrari WVDOT to All panelists
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yes, that's what I meant
from Ethan Pointer Ohio DOT to Everyone
13:38
You have a couple alrady with the LRS tools
from Ethan Pointer Ohio DOT to Everyone
13:39
Oh and when will this widget be released?
from Nicole Hanson to Everyone
13:39
Good question Ryan - I didn't think about the concurrencies
from Ethan Pointer Ohio DOT to Everyone
13:39

ok thanks
from Koschatzky, Ryan J to Everyone
13:40
Thanks for the information.
from Adrien Litton to Everyone
13:41
There's a use case for entering all events on a route where a portion of the route is subordinate.
from Koschatzky, Ryan J to Everyone
13:41
Besides event values, the event measures are also editable?
from Mark Lee to Everyone
13:42
Does this widget support Branch versioning, or does it only work against the default version?
from Koschatzky, Ryan J to Everyone
13:42
Yes, looking forward to that addition. Thanks.
from Yueming Wu to Everyone
13:43
Updates from Esri today are really exciting! Thank you.
from Shaun Perfect to Everyone
13:47
Can the current route be the default in the dropdown?
from Mike Clement-IowaDOT to Everyone
13:50
looks good
from Koschatzky, Ryan J to Everyone
13:53
I agree with Yueming, exciting options for Pro.
from Amelia Dieken to Everyone
13:55
I can't see anything
from Alex Carter to Everyone
13:55
It's slideshowing
from Shaun Perfect to Everyone
13:56
I apologize everyone, I have to run but Erin will close us out this month.
from Alex Carter to Everyone
13:59
You stopped sharing
from Kevin Hunt to Everyone
14:00
Very nice to see the inclusion of point events in the dynamic segmentation functionality!
from Aaron Ferrari WVDOT to Everyone
14:01
Great demos! We really appreciate the updates! Thanks everyone.
from Dave DiNocco to Everyone
14:02
Great presentations today!
from Claire Wang to Everyone
14:02
don't forget to vote for overlapping events design before you drop off :)
from Charles McNeel-WVDOT to Everyone
14:02
I agree with everyone. Exciting stuff ESRI shared
from Nicole Hanson to Everyone
14:02
thanks!
from Kevin Hunt to Everyone

Thank you everyone!
Claire, I still need to think about the use case more. And ask Shaun how speed limits overlap. (I would like a separate higher speed limit if possible)