



**3rd International
Symposium on
Asphalt Pavements
& Environment**

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Construction Innovation Technology & Developments

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This presentation ...

- Brief background ASPARi
- Worrying issues worldwide
- Current responses
- Research developments
- Barriers to change
- Practical issues
- Lessons for SA



Who is ASPARi?

- Researchers & contractors
- 10 companies
- More than 80% of the asphalt turnover in the Netherlands
- Focus on asphalt construction
- Improved process control



KWS



STRABAG



Worrying issues worldwide!

Clients

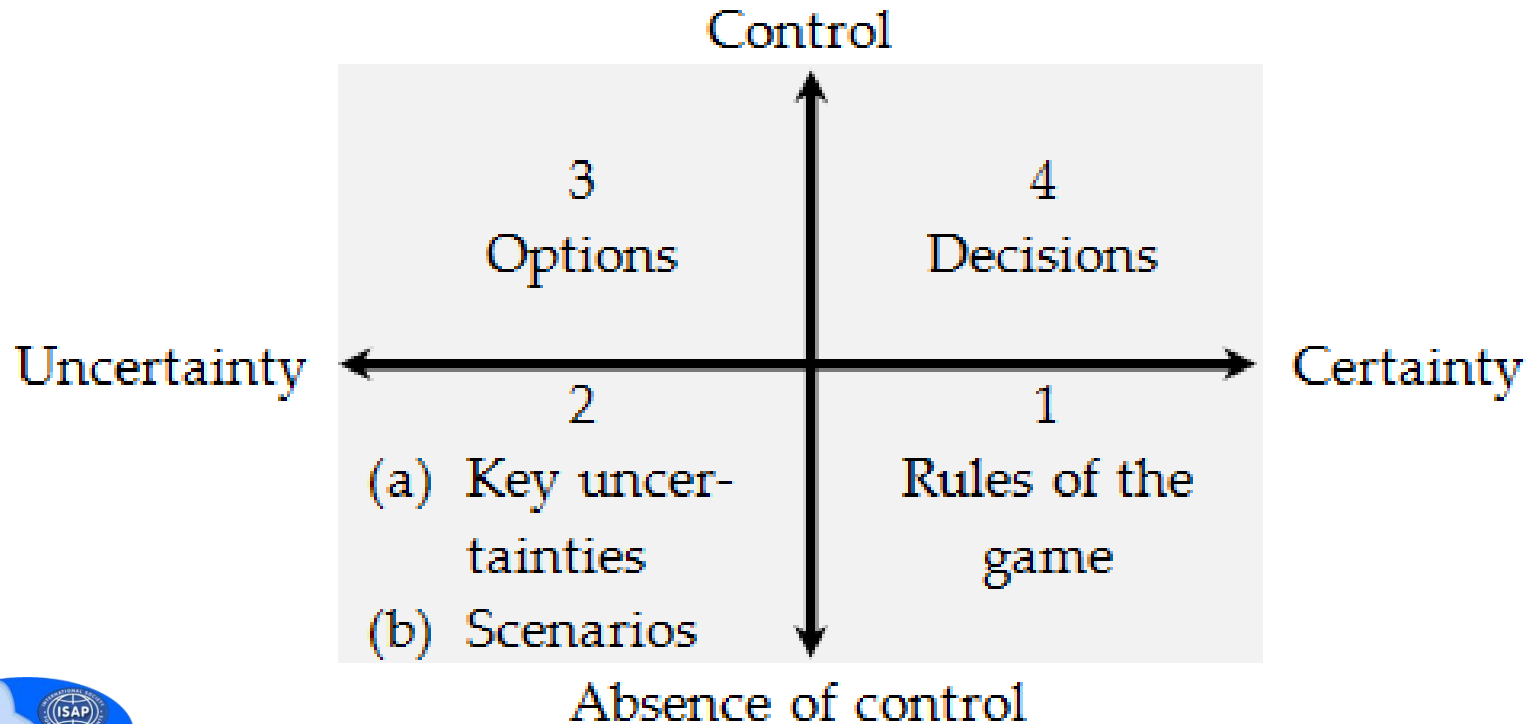
- Premature failure
- Less money available
- Value for money?

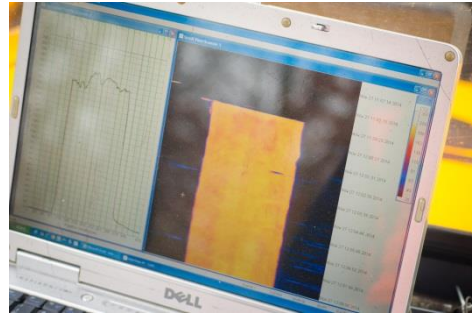
Contractors

- Asphalt construction – a traditional sector
- Ageing workforce
- Increase in technology



The response ...





Process Quality improvement cycle

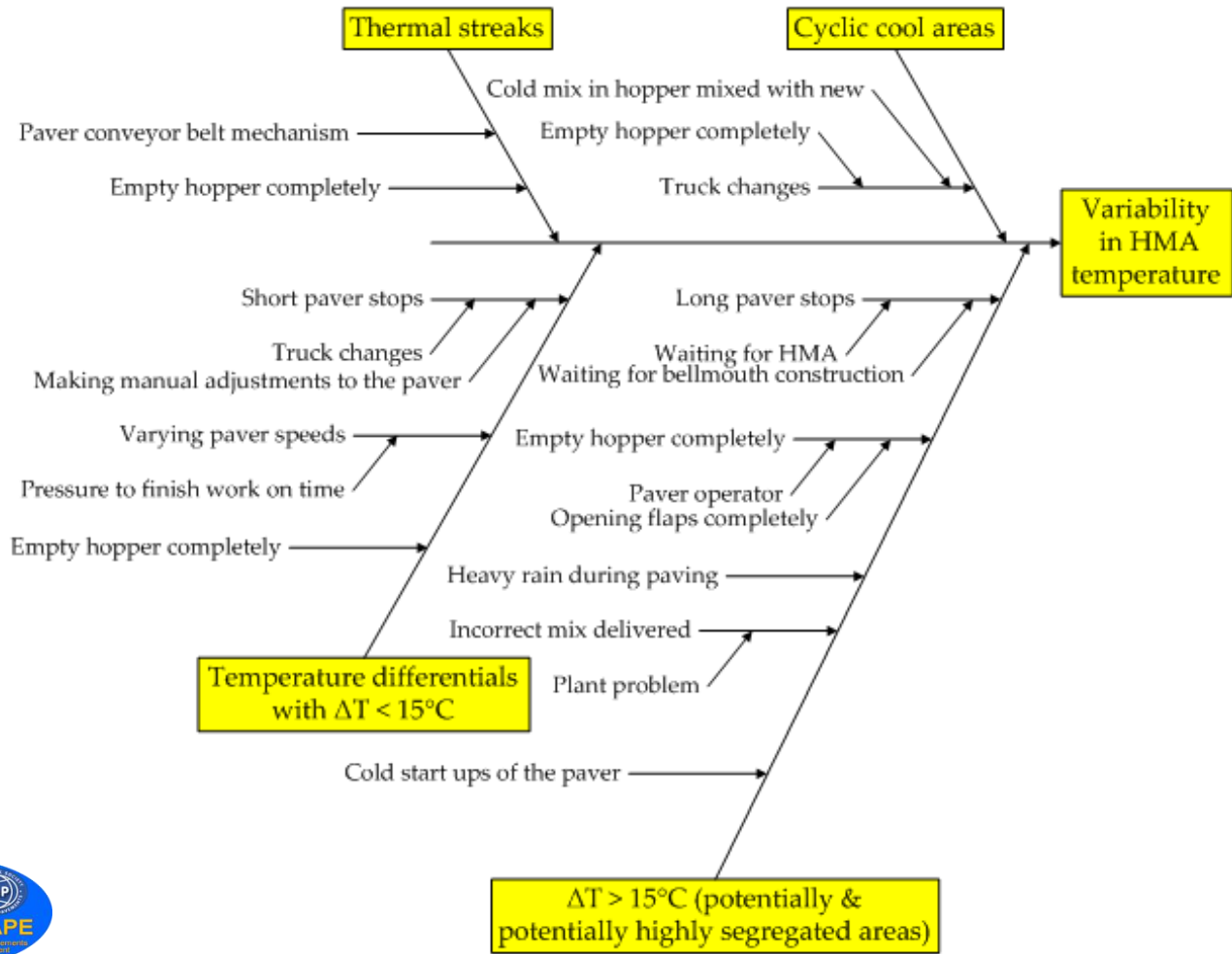


ASPARi focus areas ...

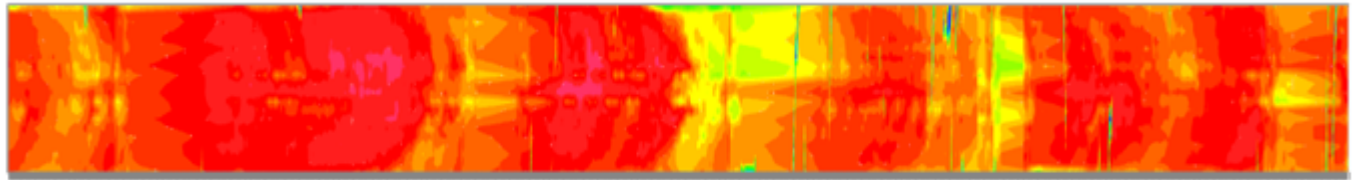
- Mix temperature & compaction consistency
- Logistics
- Laboratory
- Construction informatics
- Real-time process control
- New sensors
- BIM
- Education

So, what are
the benefits
thus far ... if
any?

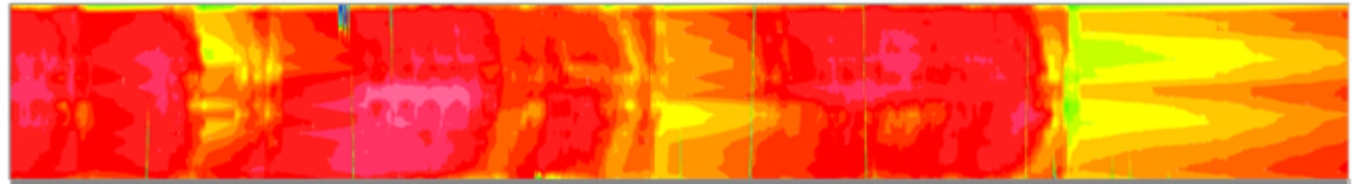




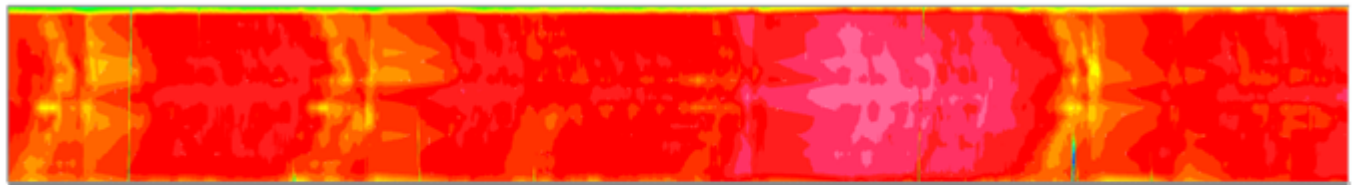
Typical Temperature Contour Plot



7:59:38 7:58:53 7:58:08 7:57:23 7:56:38 7:55:52 7:55:07 7:54:22 7:53:37 7:52:52 7:52:07 7:51:21 7:50:36 7:49:51 7:49:06 7:48:21 7:47:36 7:46:50 7:46:05 7:45:20 7:44:35 7:43:50 7:43:05 7:42:19 7:41:34 7:40:49 7:40:04 7:39:18 7:38:34 7:37:48 7:37:03 7:36:18 7:35:02 7:33:36 7:31:40 7:30:27 7:29:41 7:28:56 7:28:11 7:27:26 7:26:40 7:25:56 7:25:10 7:24:25 7:23:40 7:22:55 7:22:09

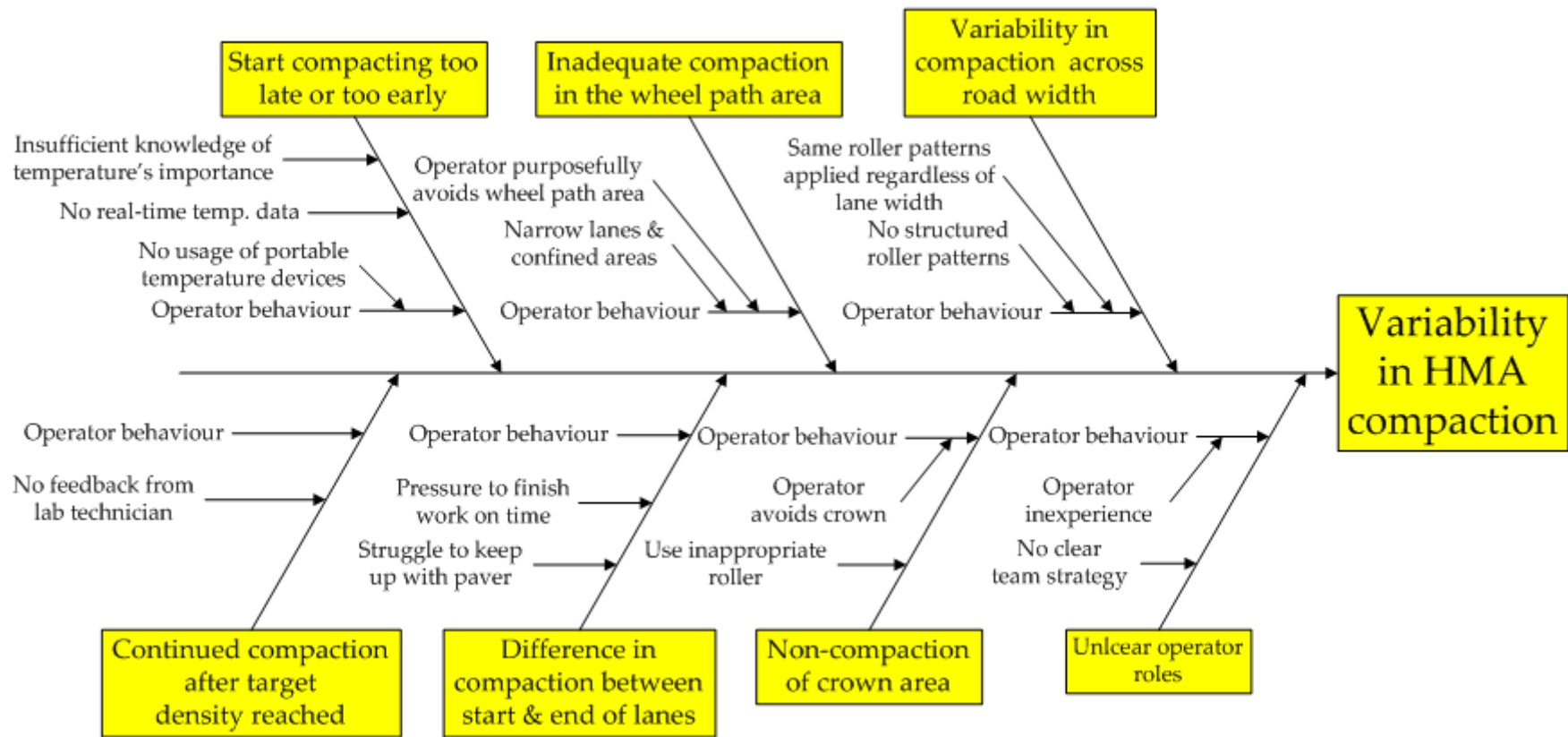


8:59:41 8:59:02 8:58:24 8:57:45 8:57:06 8:56:27 8:55:49 8:55:10 8:54:31 8:53:53 8:53:14 8:52:35 8:51:56 8:51:18 8:50:39 8:50:00 8:49:22 8:48:43 8:48:04 8:47:25 8:46:46 8:46:08 8:45:29 8:44:51 8:44:12 8:43:33 8:42:54 8:42:15 8:41:37 8:40:58 8:40:19 8:39:41 8:39:02 8:38:23 8:37:44 8:37:06 8:36:27 8:35:48 8:35:10 8:34:31 8:33:52 8:33:13 8:32:35 8:31:56 8:31:17 8:30:39 8:30:00

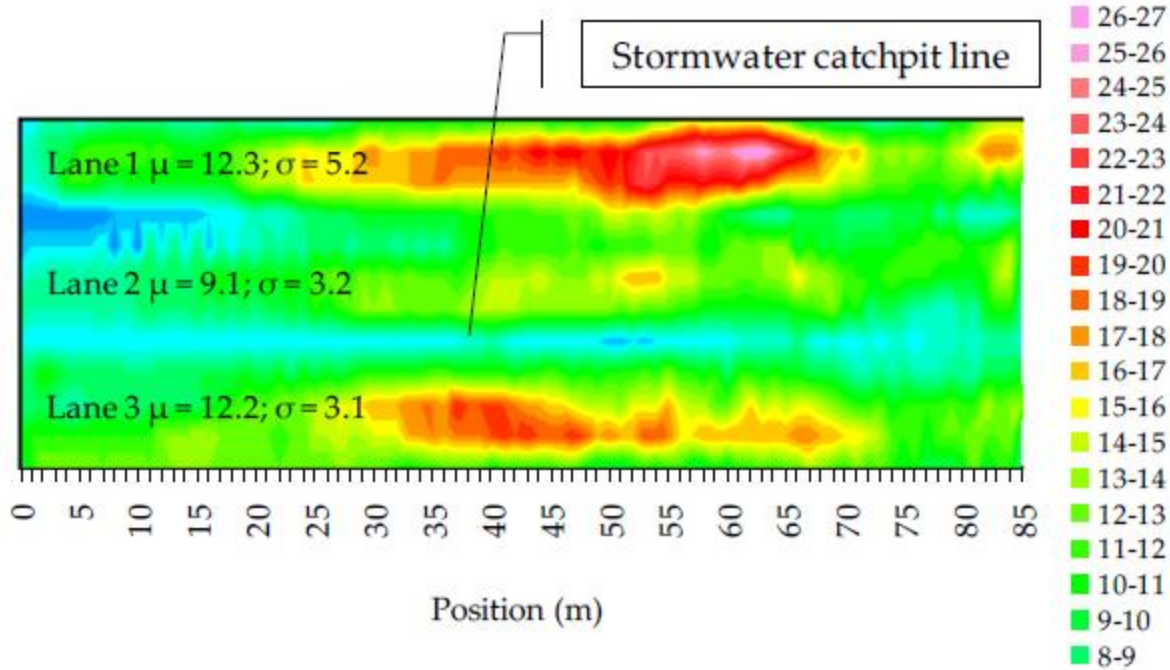


9:29:41 9:29:02 9:28:23 9:27:45 9:27:06 9:26:27 9:25:49 9:25:10 9:24:31 9:23:52 9:23:14 9:22:35 9:21:56 9:21:18 9:20:39 9:20:00 9:19:21 9:18:43 9:18:04 9:17:25 9:16:47 9:16:08 9:15:29 9:14:50 9:14:12 9:13:33 9:12:54 9:12:16 9:11:37 9:10:58 9:10:19 9:09:41 9:09:02 9:08:23 9:07:45 9:07:06 9:06:27 9:05:48 9:05:09 9:04:31 9:03:52 9:03:14 9:02:35 9:01:56 9:01:17 9:00:38 9:00:00

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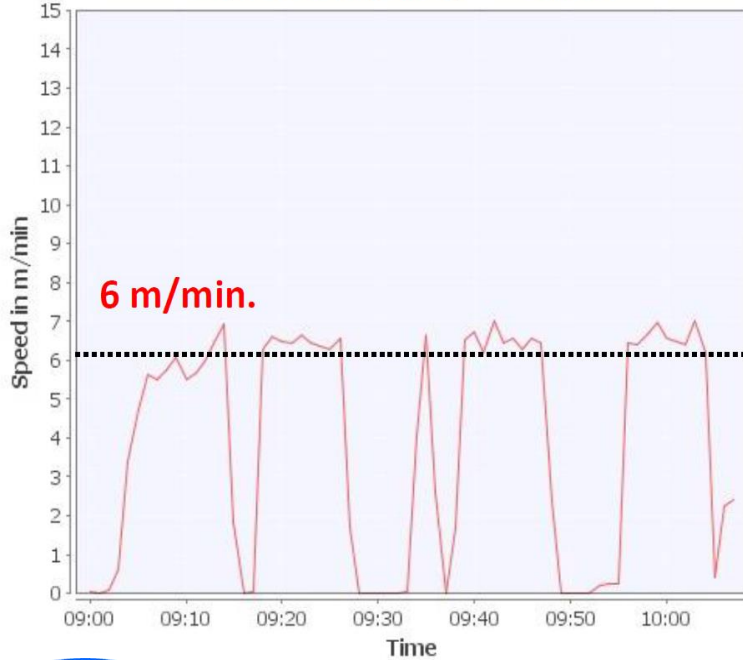


Typical Compaction Contour Plot ...



Paver speeds ...

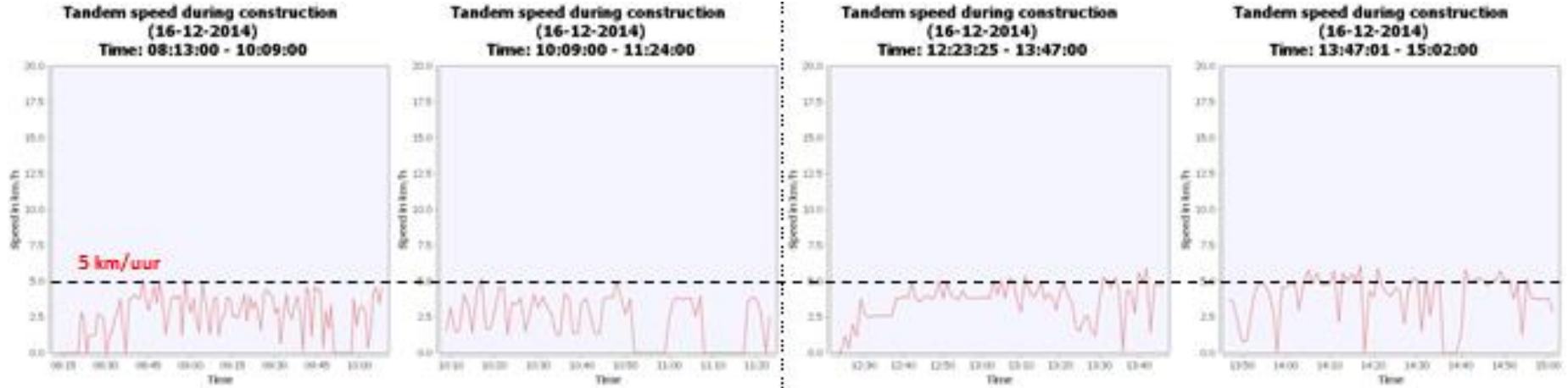
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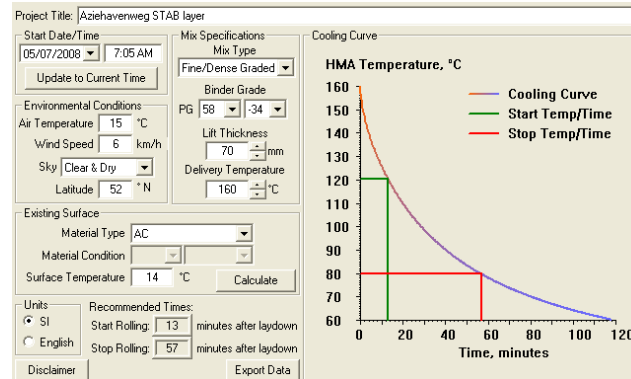
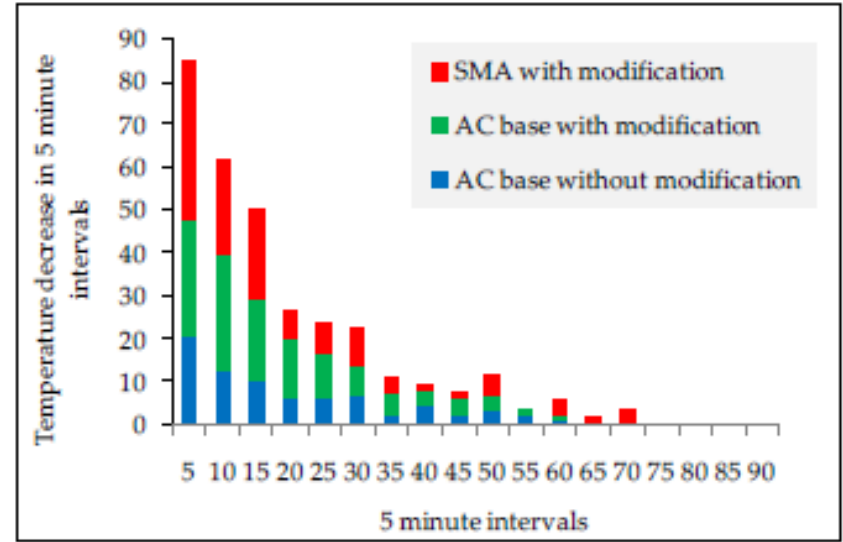
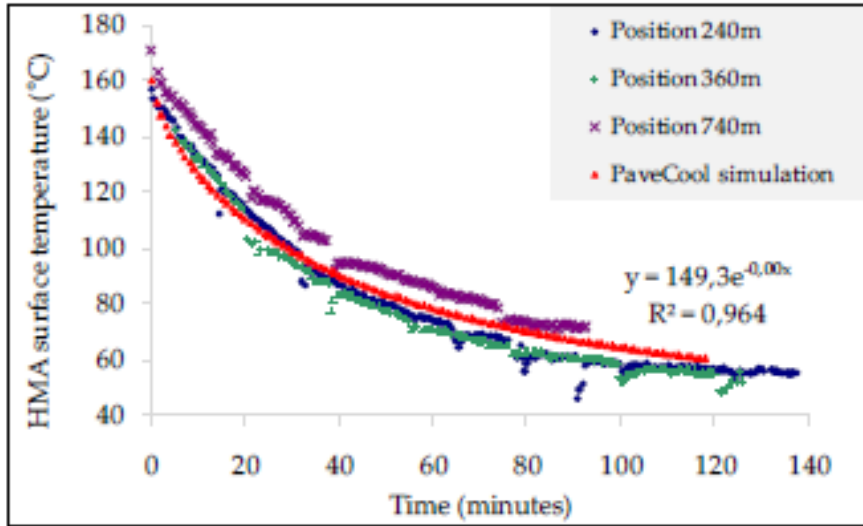
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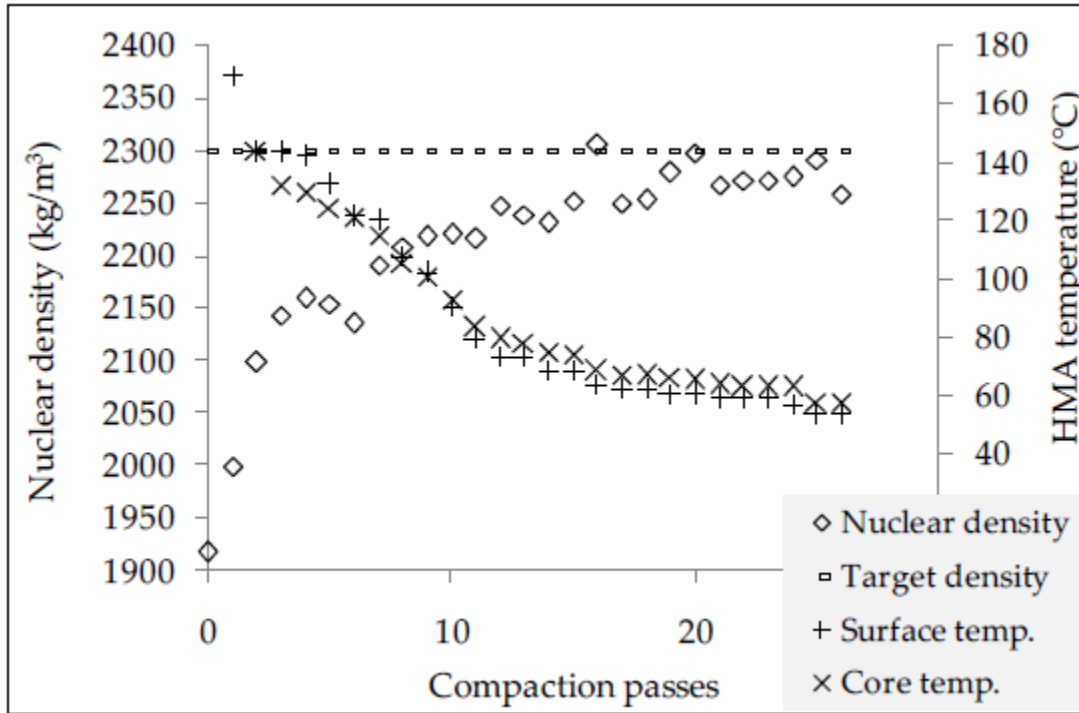
Roller speeds ...

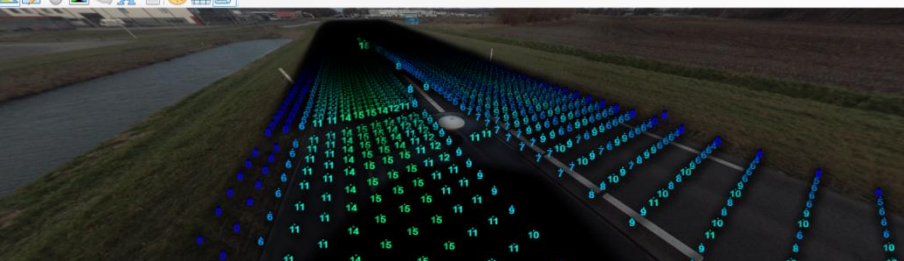
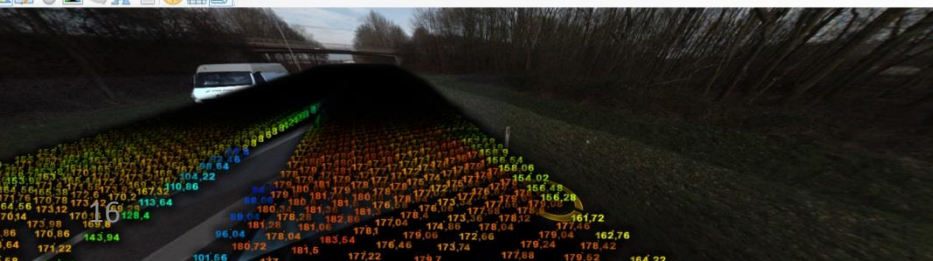
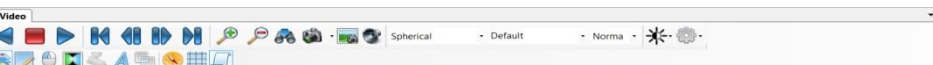
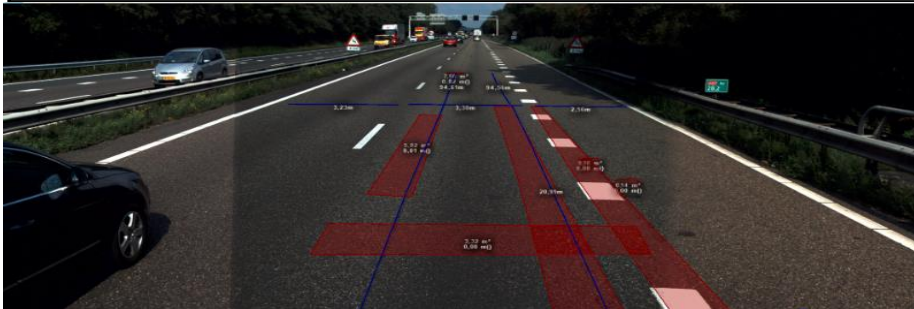
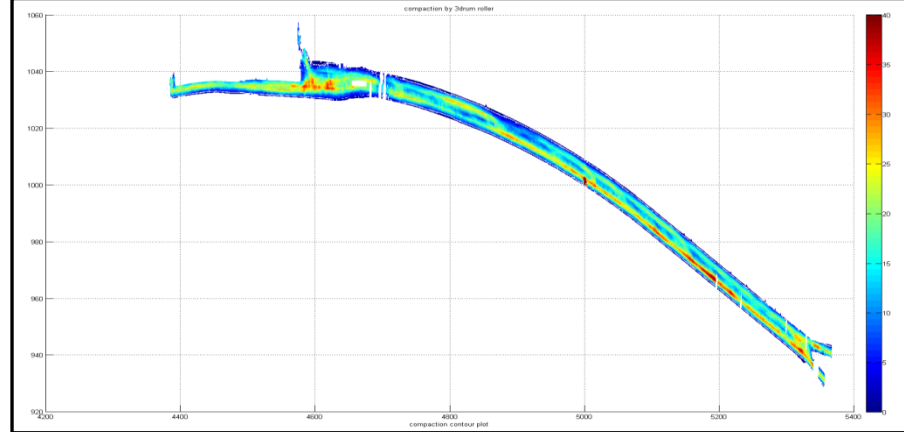
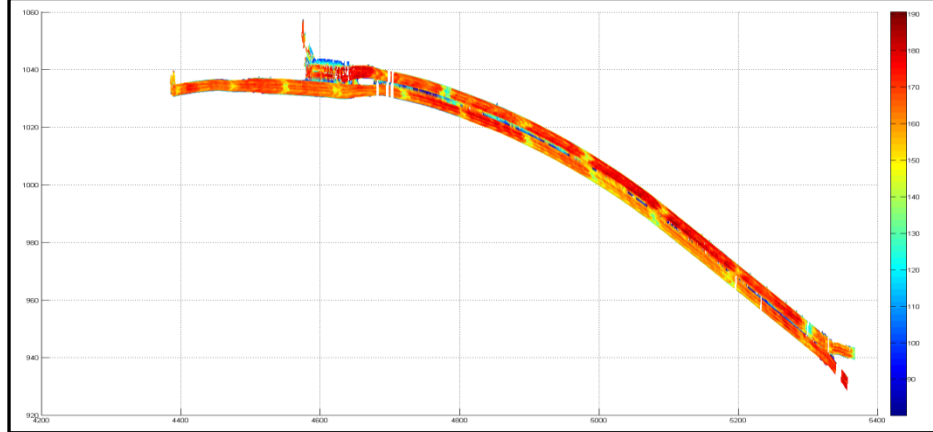


Understanding cooling behaviour

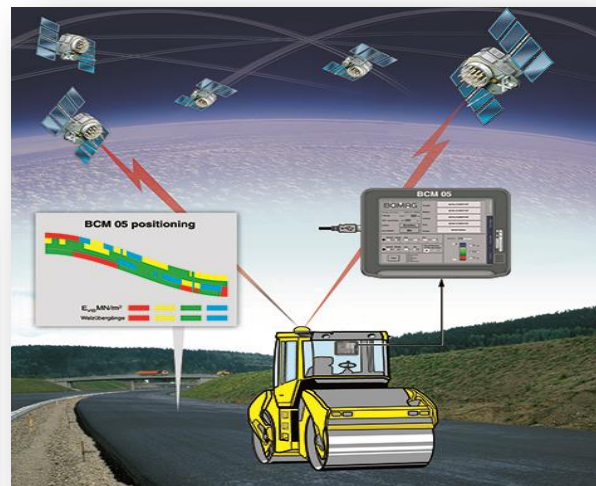
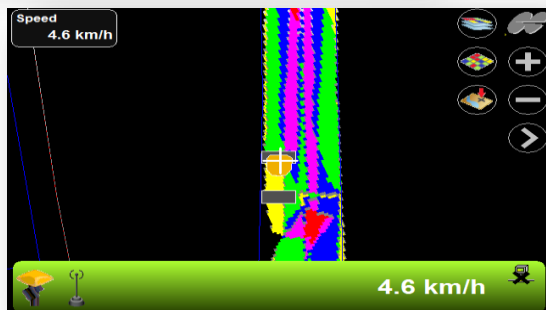


Understanding cooling behaviour and density progression

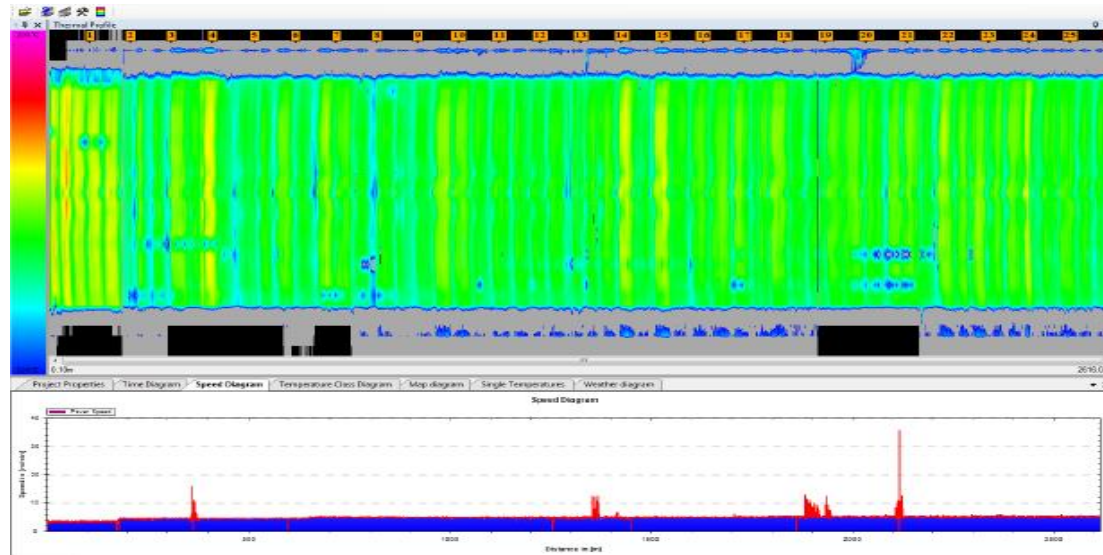




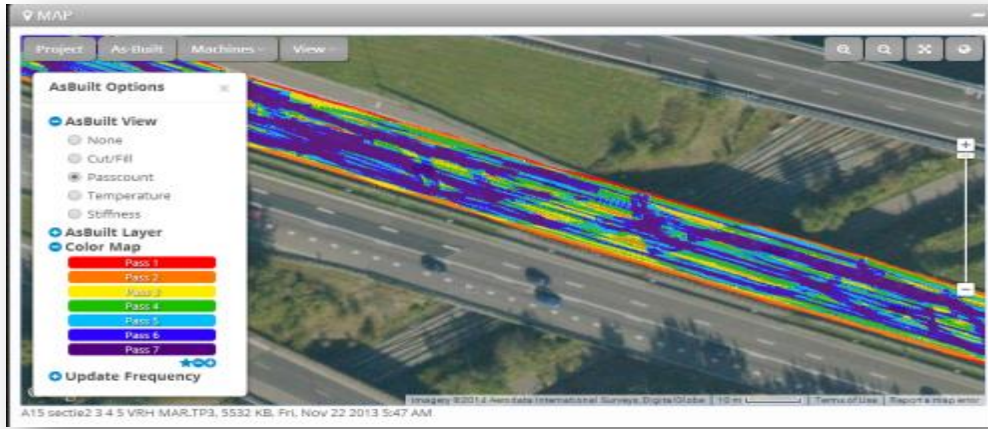
Compaction innovations



Paving innovations



Reporting



Post-processing!



Beware ... barriers to change

- Business as usual approach
- Technology cost, introduction & adoption
- Changing roles in asphalt construction
- Mismatch in client, designer & contractor needs
- Inappropriate client approaches
- Equipment manufacturer approaches
- Absence of appropriate education



Practical issues ...

- Technology & the human factor
- In technology we trust???
- The pace of technology development
- Big data & real-time process control
- Aligning laboratory & field practices
- Working with machine manufacturers
 - Open vs. closed systems
 - Data standards
 - Data interoperability



Lessons for SA ...

A client driven approach to stimulate innovation in asphalt construction!!!!

Potential benefits include ...

- Measuring is knowing ... georefencing
- Identify opportunities for process improvement
- From experienced-based to method-based practices
- Get it right the first time
- Increased durability of asphalt layers
- Operational, tactical & strategic decision-making



**Thank you for listening ...
any questions?**

