

# *Category 4: Excellence in Pavement Recycling and Stabilisation in Local Government*

Stabilisation Advocation & Leading Pavement Recycling Innovation in Local Government

Mohamed Dewji, Pavements Engineer  
Liverpool City Council



## *2022 AustStab Awards of Excellence*

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# The Initiative: Making a Difference in the Big Picture

- Liverpool City Council is a metropolitan local government using stabilisation as part of Council's ongoing maintenance program
- Over many years, the use of stabilisation as a direct alternative to deep-lift asphalt has produced quantum benefits "in the big picture"
- Pavements Engineer for Council, Mohamed Dewji, has played a key role in implementing stabilisation and pavement recycling



*Making a Difference in the Big Picture*

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# Details of the Initiative

- Over approximately 5 years since moving into his current role with Council, Mohamed has:
  1. Demonstrated recognition of the sustainability benefits and subsequent commitment to maintaining stabilisation as an important part of Council's rehabilitation program
  2. Individually driven 20+ projects using stabilisation over many years
  3. Explored innovation within the pavement recycling industry for Council
  4. On many occasions, actively sought stabilisation and pavement recycling alternative options to move beyond standard methods of deep-lift asphalt

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Pavement Recycling and Stabilisation Association

# Context

- Liverpool City Council is a Sydney Metropolitan local government
- Located in the south-west of Sydney and governs 42 suburbs
- The area consists of a blend of urban and semi-urban roads



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# Challenges

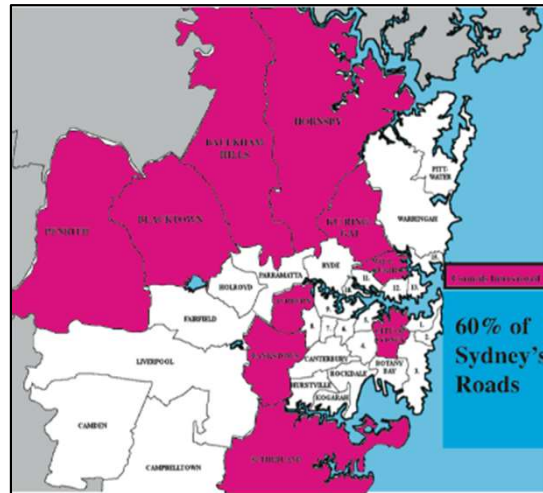
- Council is faced with an immense and ongoing pavement maintenance challenge
- Rapid increase in traffic loading, especially heavy vehicles accessing Motorways (M57)
- Existing pavements consist of degenerated unbound granular/AC and minimal thickness
- Clay subgrades with high plasticity
- High urban density with kerb and gutters
- Pressure from the community
- Limited financial budget
- *These challenges are shared with other metropolitan areas*



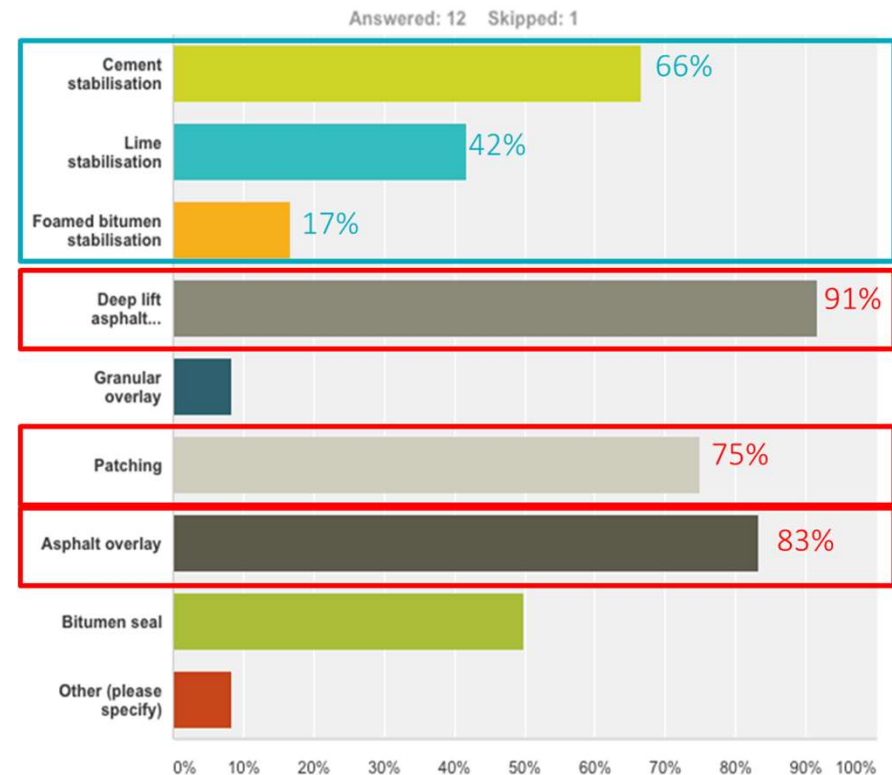
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# The Operating Environment

- Asphalt methods are the indoctrinated method of pavement rehabilitation, especially in Sydney
- Evidence – 10 Councils governing 60% of Sydney’s roads were surveyed
- Although stabilisation and pavement recycling are used, asphalt is the prevailing standard method
- Few Councils are making the most of the benefits stabilisation has to offer



What are your most commonly used methods for road rehabilitation? (More than one answer may be selected)



Source: Smith, D. A critical analysis of foamed bitumen stabilisation and deep lift asphalt replacement as road rehabilitation methods, 2014

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# Leading Advocation and Implementation

## History of Stabilisation Projects in Liverpool City Council

Note: shown are projects undertaken by SPA and it is understood that there are additional scattered and few projects also undertaken and not listed here



\*Interesting Fact\*  
1998-9 projects were  
Foamed Bitumen

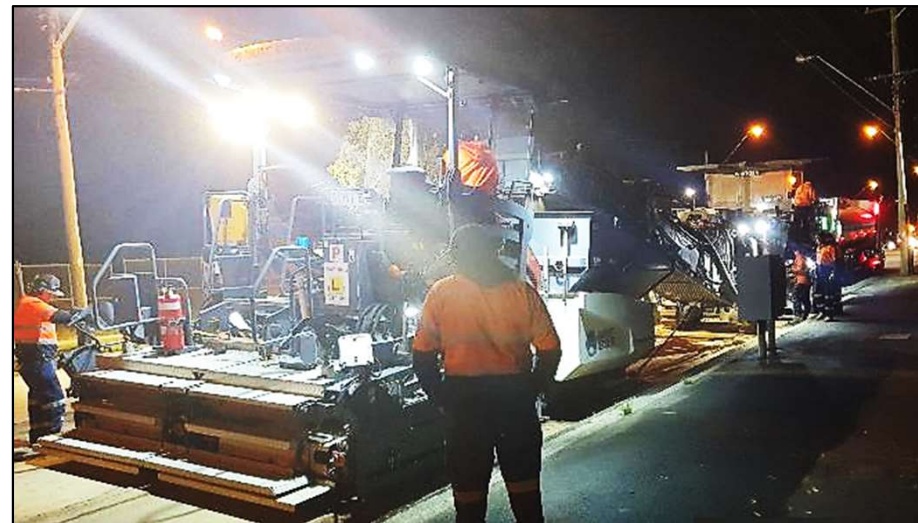
- Council has a history of stabilising roads dating back to the early 1990s
- Hiatus in pavement recycling occurred, with deep-lift asphalt disproportionately selected
- However recently, Liverpool City Council have begun implementing more stabilisation projects
- Recent projects have been taken off the asphalt program

Resurgence of stabilisation with Mohamed in acting role

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# Innovation

- Liverpool City Council was one of the first Sydney Metropolitan Councils and Australian clients to use Paver Laid Insitu Recycling



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# Evidence of Success

- Cost benefits of implementing stabilisation instead of deep-lift asphalt for the recent projects
- Cost savings of approx. \$5.8M over 5 years
- Which is a 54% cost reduction on the entire program

1	m <sup>2</sup> on average per site	5,000
2	number of recent projects	20
3	total m <sup>2</sup>	100,000
4	total m <sup>3</sup> of asphalt at 150mm deep	15,000
5	total tonnes of asphalt at 2.4t/m <sup>3</sup>	36,000
6	total cost of asphalt at \$300/t*	\$10,800,000
7	total cost of stabilisation at \$50/m <sup>2</sup> **	\$5,000,000
8	cost savings (6-7) (\$)	\$5,800,000
9	cost savings (8/6) (%)	54%

**Table 1.** Cost comparison with deep lift asphalt and stabilisation on completed projects

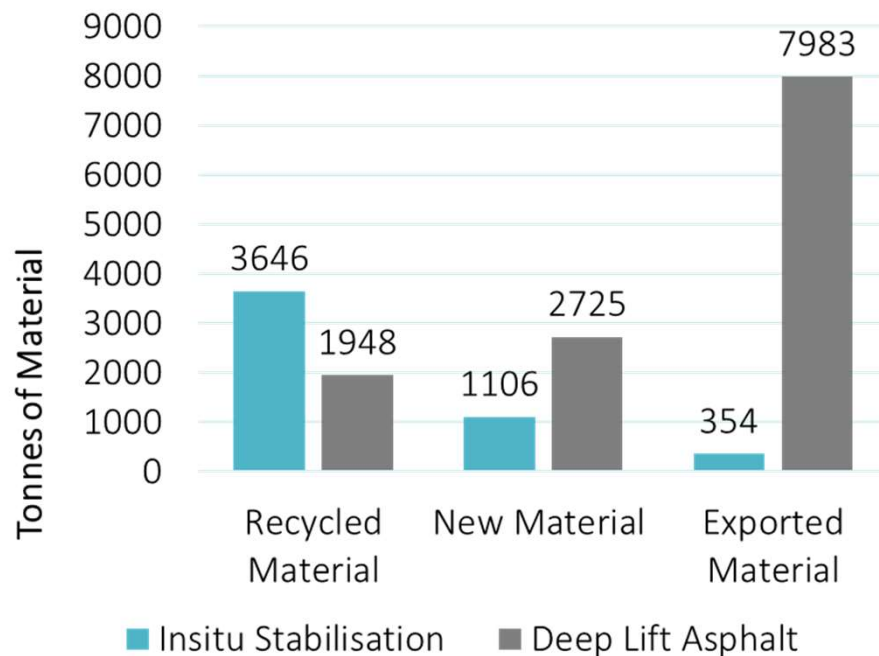
\* Tonnage rate for asphalt provided by external asphalt contractor

\*\* Stabilisation rate is a conservative average to account for any supplementary gravels, AC wearing courses, foamed bitumen etc.

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# Evidence of Success

- Environmental and sustainability benefits example for one project
- Mohamed uses such examples of sustainability to advocate stabilisation alternatives to deep-lift asphalt



Insitu Stabilisation	Deep Lift Asphalt
50mm AC10 wearing course, 10mm C170 single spray seal, 250mm insitu recycled pavement using foamed bitumen	50mm AC10 wearing course, 170mm AC20 intermediate course
<ol style="list-style-type: none"> <li>1. Stabilise and recycle the existing road materials in a single-layer depth of 250mm deep with foamed bitumen technology</li> <li>2. Trim project slightly to ensure levels</li> <li>3. Apply a single coat C170 spray seal</li> <li>4. Apply 50mm AC10 wearing course</li> </ol>	<ol style="list-style-type: none"> <li>1. Excavate and remove up to 220mm deep of existing pavement materials and remove from site for disposal</li> <li>2. Import and place newly manufactured asphalt in multiple layers</li> </ol>

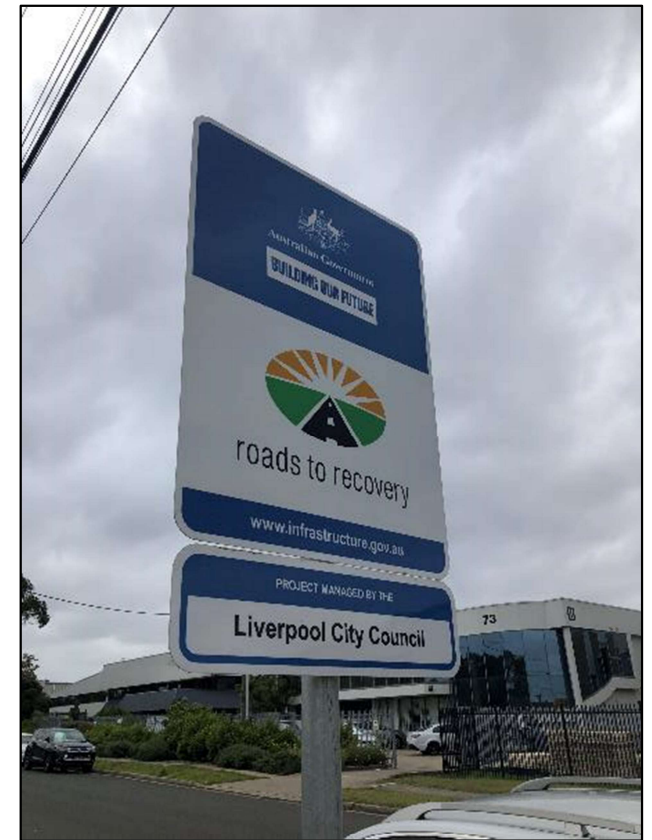
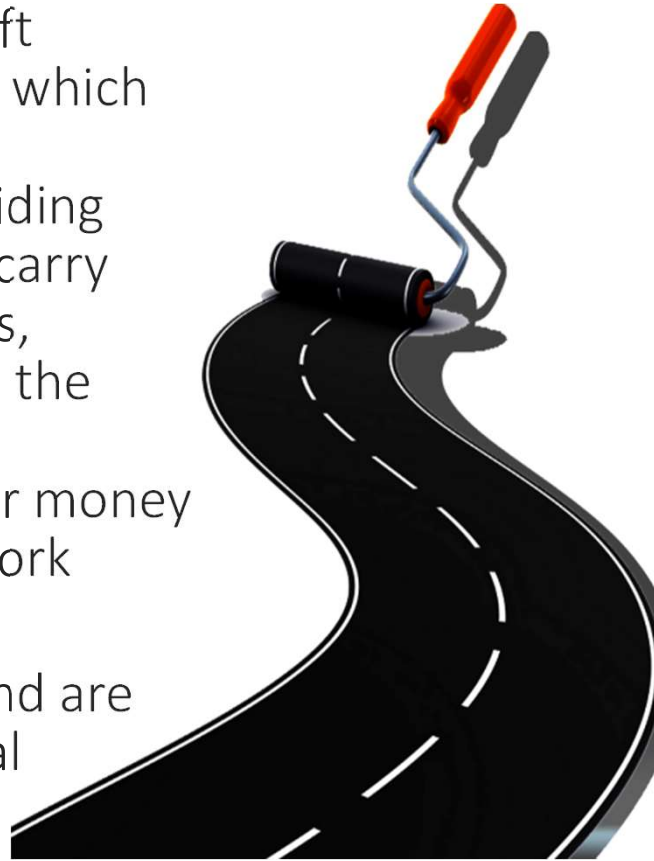
**Table 1.** Stabilisation and deep-lift asphalt options for a project in Liverpool City Council

- 66% reduction/savings in greenhouse gas emissions
- Prevents 1,288 heavy vehicle movements to-and-from site across the local road network, which is equivalent to saving heavy vehicle movements by 86%
- Stops the waste of 7,629 tonnes of valuable existing pavement materials, which is equivalent to saving exporting and disposing material by 96%

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# Looking Beyond the Big Picture and Moving Beyond Asphalt

- Rather than typical deep-lift asphalt or asphalt options, which are often selected due to conservatism despite providing short-term outcomes and carry ongoing maintenance costs, Mohamed is committed to the whole-of-life benefits and achieving the best value for money across Council's road network
- Mohamed and Council are deserving of recognition and are an inspiration to other local governments



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