

INSTACURE

THE ROAD SAFETY GAME CHANGER

A GREAT OPPORTUNITY
TO GET INVOLVED



QR to be updated



INSTACURE

A game-changing opportunity

At the bottom of the world, three Kiwi companies have got together to create a world-beating road safety technology:

Instacure, an innovative road marking coating that cures within 1.5 seconds.



INSTACURE IS ALREADY SHOWING THAT IT IS A GAME-CHANGER IN ROAD SAFETY

Through a thorough trial of Instacure over the two years on Auckland's North Shore roads, evidence is already showing numerous features that benefit road users, workers, operators, and owners:

- **Greater productivity** – less disruption to road users
- **Higher retro reflectivity** – Instacure's retro reflectivity is much higher than current paint applied to rural roads and urban areas
- **Greater safety** – for road workers and road users, through vastly increased retro reflectivity and less time on the road
- **Environmentally beneficial** – reduced VOC release and less chance of run-off
- **Longer-lasting** – a longer-life product compared to other NZTA M7 paint alternatives (one year maximum life) so roads do not need to be repainted every year



Partners on the journey together

Damar

Damar is a New Zealand owned and operated, innovative manufacturer of coatings, chemicals and aerosol products.

Founded in 1986, Damar has been market leader in innovation across chemicals, coatings and aerosols, and has been the long-term road marking industry leader and innovator in Australasia.



Strouds

With 45 years of industry experience, WA Strouds Limited is New Zealand's most sought-after spray and dispensing equipment solution provider.

Our dedicated and professional team provides insight into paint, resin and adhesive application solutions.



Coastline Markers

Coastline Markers is one of the largest road marking and safety product application companies in New Zealand.

In business for more than 30 years, today, a division of Fulton Hogan, we employ more than 50 staff, a substantial fleet of state-of-the-art line marking equipment and we have a strong presence across New Zealand.



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With key partners on the journey we can all achieve much more

There is limited worldwide research so far.

We invite you to be involved in a much wider trial to together produce data that will show the benefits to road user and worker safety.

A full project will also be able to advance road safety beyond New Zealand.

We seek the chance to:

- 1. Show you** – what Instacure can do, and where we might trial it together, to lift road safety at an efficient cost and drive environmental benefits
- 2. Work with you in operating a wider project** to apply instacure onto rural roads and to monitor its performance and benefits thoroughly.

Come along on the Instacure journey.

What is Instacure?

The ultimate road marking solution for safer roads

Instacure is a game changer in road safety, a revolutionary ultraviolet (UV) curing road marking system that provides fully curable and trafficable road markings in just 1.5 seconds.

Horizontal road markings are an integral part of almost every modern roadway. They are a necessary basic road safety feature.

A world-first technology

Developed by Damar Industries after 16 years of extensive research, Instacure represents a world-first technology that supports *The Road To Zero*.

Compared to traditional road marking systems, Instacure has many advantages, offering long-life durability with the ease of application of a simple paint system.

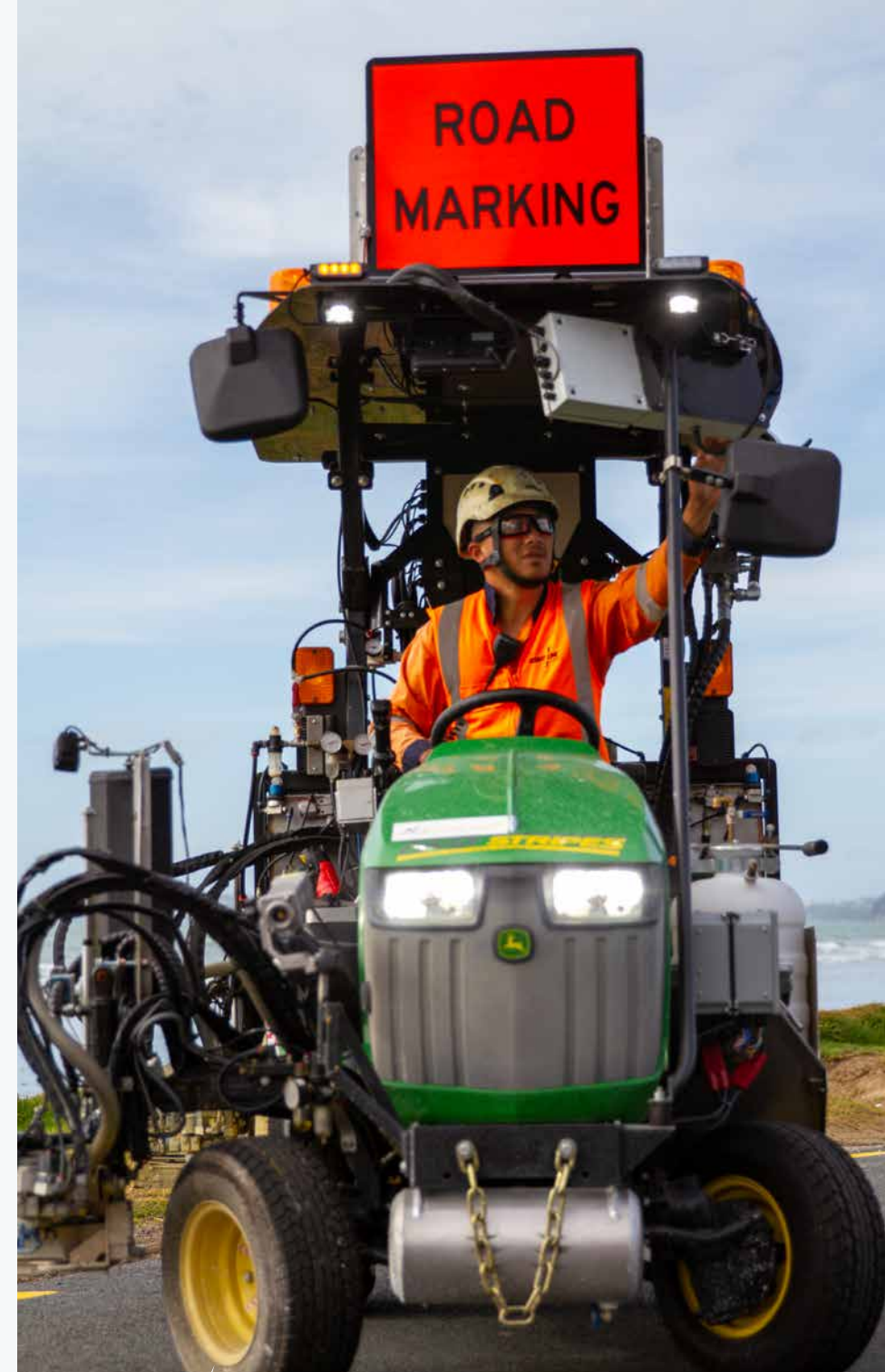
The potential to make a significant contribution to improving safety on New Zealand's roads

Thanks to its ultra-fast curing time, Instacure drastically reduces the time road workers spend on the road, requiring fewer workers for the job and minimising disruptions for road users.



After almost two years of application and refinement on Auckland roads, the data is showing that Instacure is a long-life road marking application that significantly improves nighttime retro reflectivity and road safety for all road users.

It is also environmentally friendly compared to other products currently in use, with only trace volatile organic compounds (VOC), offering a significant reduction in carbon emissions.

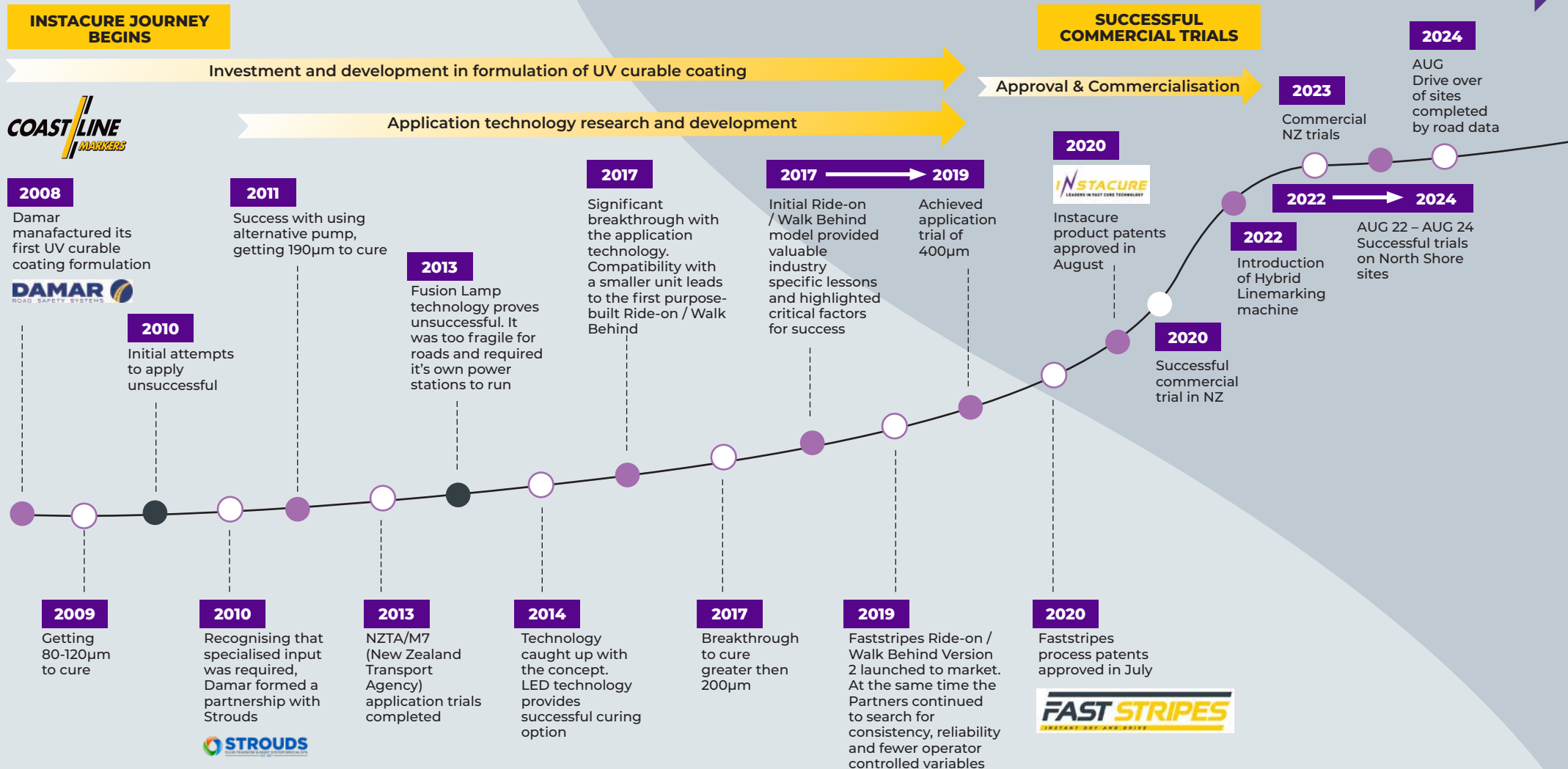


INSTACURE ...THE DEVELOPMENT JOURNEY

Instacure is the result of a 16-year R&D journey between Damar and Strouds...

2008

2024





HOW IT WORKS

SPECIALISED COATING

Specifically formulated UV curable coating.

Excellent adhesion, bead embedment, visibility and retroreflectivity, aligned to the best products in the market.

INNOVATIVE APPLICATION TECHNOLOGY

UV curable road marking system specifically formulated for spray applied line marking

FULLY CURED & TRAFFICABLE ROAD MARKING IN 1.5 SECONDS



SUPERIOR PERFORMANCE OVER A YEAR
vs approved NZTA M7 paints



Instacure – UV bead coverage



Solvent acrylic bead coverage

SPECIALISED COATING
(Instacure)
(patented)



INNOVATIVE APPLICATION TECHNOLOGY
(Faststripes)
(patented)



INSTANT CURE ROAD MARKING
INSTACURE



TRIALS SO FAR...

As a group, Damar, Strouds and Coastline Markers have worked together to improve the technology, product and application to deliver a real-world, provable solution.

Between August 2022 and August 2024, Instacure has undergone extensive research and development, with a focus on improving the product applied technology and providing evidence of its effectiveness and viability.

We have applied Instacure throughout our work sites on Auckland's North Shore, from Devonport to Millwater and all sites in between.

Application, testing and refining over a two-year period has provided crucial evidence to support the potential of Instacure as a game changer in the road marking industry.

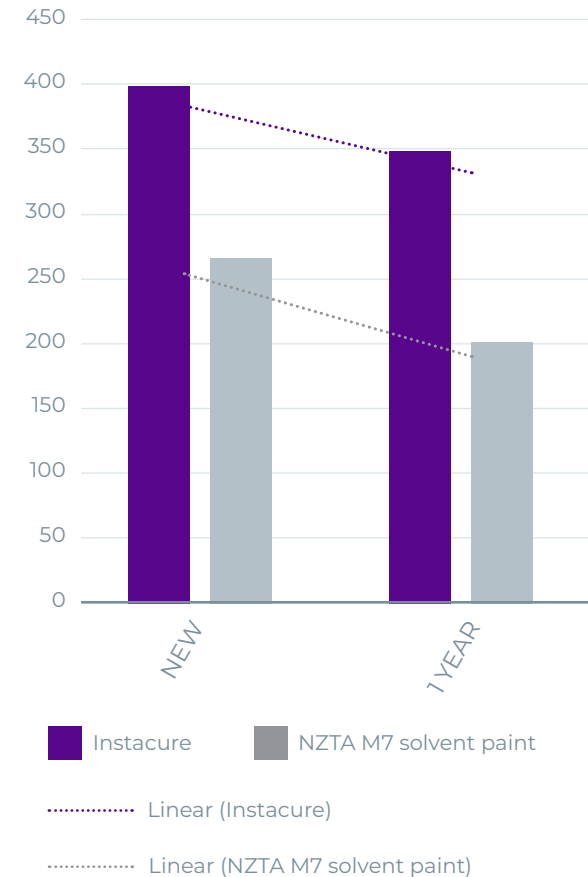
We have extensively tested and improved the product, machines and application techniques during this phase.

The unique combination of sustainability, durability, and long-lasting results make Instacure a promising solution for safer roads

With a strong focus on bringing Instacure to a wider market and making a positive impact, the team are confident in the ability of Instacure to provide a significant advancement in road safety.

The following pages show independent data gathered by Road Data highlighting the performance of UV and other NZTA M7 paints over a twelve-month period:

Retroreflectivity

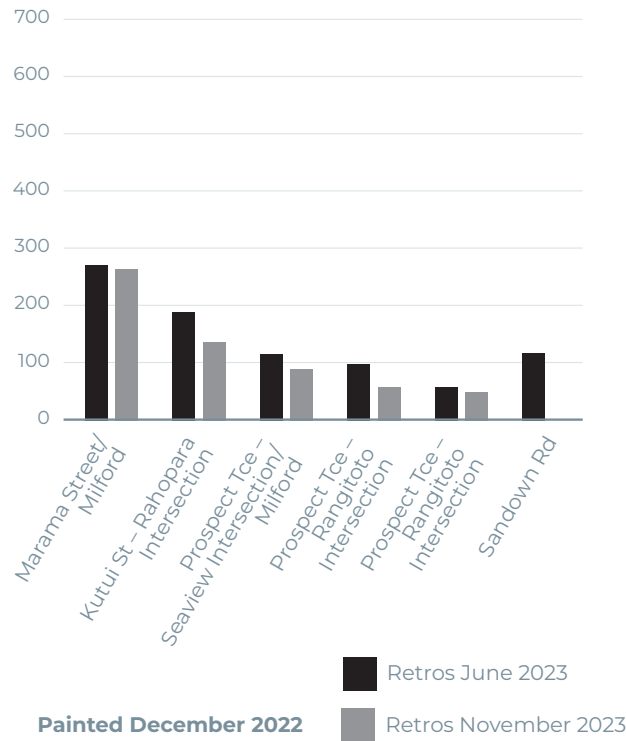


The superior performance of UV can clearly be seen in both initial application and after twelve months.

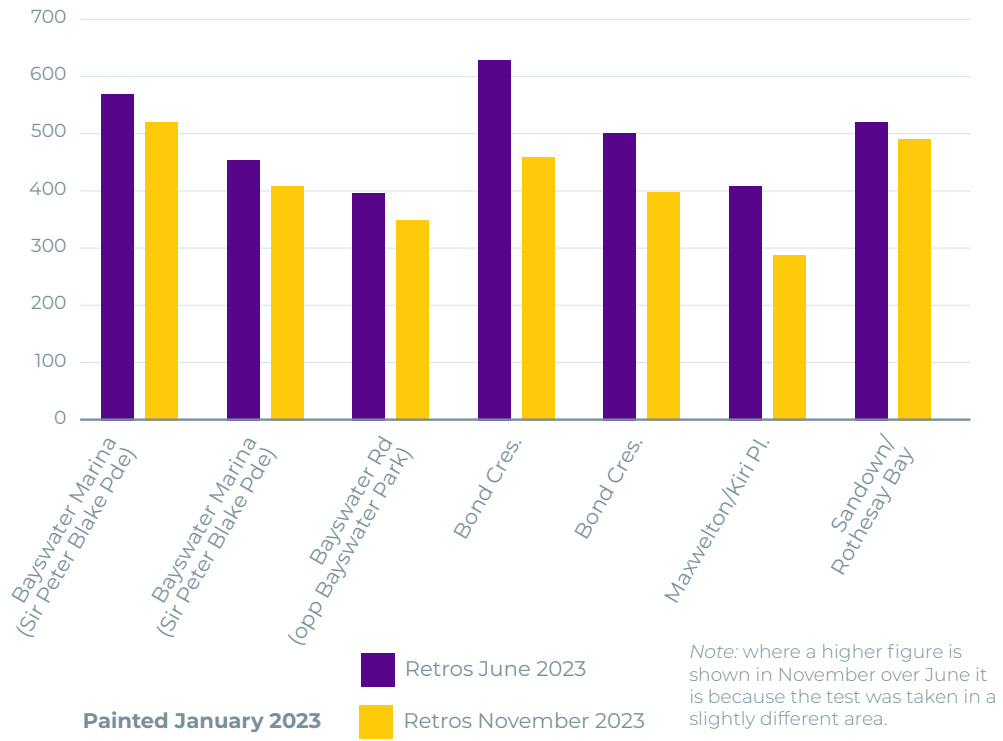
Performance that stacks up

Trials so far undertaken by Road Data in a variety of locations reveal early proof that Instacure's performance is superior to other NZTA M7 alternatives:

Retros – Solvent M7 – White



Retros – Instacure – White



Instacure Performance (NZTA M7)

Specification	Instacure	NZTA M7 Rating
Product durability	5 million vehicle passes	Long-life
Retroreflectivity (RL)	5 million vehicle passes	>150MCD
Dry time	1.5 seconds	<7 minutes (rapid cure)
Skid resistance	Exceeds standards	>45BPN

High reflectivity on application and after a 12 month period.

Great durability over time

Rigorous testing by the renowned AETEC Laboratory in Madrid has shown that Instacure has exceptional durability:

Instacure White

Drop-on – Potters Echostar HP AC02											
PROPERTY	CLASS	DURABILITY									
		P Traffic Classes and Wheel Passes x 10 ⁶									
		P0	0.01	P4	0.5	P5	1.0	P6	2.0	P7	4.0
Retroreflectivity (RL) - Dry	R	R5	523	R5	369	R5	320	R4	239	R3	199
Retroreflectivity (RL) - Wet	RW	RW6	273	RW6	235	RW6	222	RW6	207	RW6	162
Retroreflectivity (RL) - Rain	RR	RR5	133	RR6	171	RR6	174	RR6	151	RR5	124
Diffuse Illumination (Qd)	Q	Q5	226	Q5	220	Q5	222	Q5	207	Q5	213
Pendulum Skid Resistance (SRT)	S	S4	62	S4	64	S4	62	S4	62	S3	56

THE TESTING SHOWS:

1. Astonishing results across all properties up to P7 or 4M wheel passes.
2. Dry retro-reflectivity above maximum level of R5 ($\geq 300\text{mcd}$) up to P5 or 1M wheel passes. R4 ($\geq 200\text{mcd}$) at P6 or 2M wheel passes. Just missed R4 by one point at P7 or 4M wheel passes.
3. Wet retro-reflectivity above maximum level of RW6 ($\geq 150\text{mcd}$) at all P classes.
4. Rain retro-reflectivity at RR5 ($\geq 100\text{mcd}$) for P0 and P7. Maximum level of RR6 ($\geq 150\text{mcd}$) at P4, P5 & P6.
5. Diffuse illumination or daytime brightness above maximum level of Q5 ($\geq 200\text{mcd}$) at all P classes.
6. Pendulum skid resistance at S4 ($\geq 60\text{SRV}$) for P classes P0 to P6. Still S3 ($\geq 55\text{SRV}$) at P7. Note that this property is arguably influenced by the substrate texture due to how thin the coating is compared to a traditional thermoplastic.

PLEASE NOTE:

- The material dosage was measured at 350g/m^2 . This may be on the high side as Damar recommend $280\text{-}300\text{g/m}^2$. However, my concern is that even at 350g/m^2 , the substrate is beginning to show through at P3 or 200K wheel passes (photo not included but available) and certainly more significantly at P4 or 500K wheel passes.
- The bead dosage was measured at 250g/m^2 . This is significantly lower than what Damar recommend of between $375\text{-}425\text{g/m}^2$. That said, the results speak for themselves!
- The progressive wear from P4 to P7.

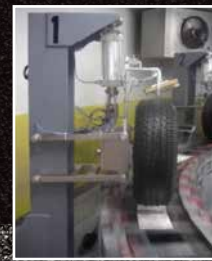
Testing undertaken by the AETEC Laboratory

aetec

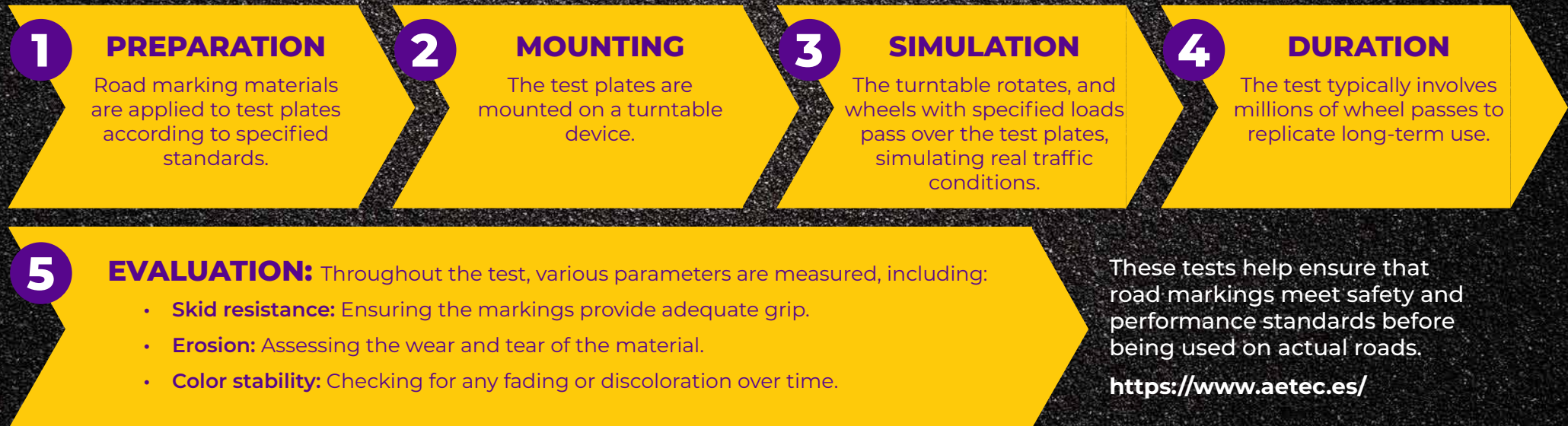
The AETEC (Asociación para el Estudio de las Tecnologías de Equipamiento de Carreteras) Laboratory is a highly regarded testing laboratory based in Madrid, Spain.

Founded in 1999, AETEC specialises in testing road marking materials, including turntable testing to EN 13197:2012+A1:2014 standard. AETEC employs a variety of methods to evaluate the performance and durability of road marking materials. One of their key methods is the turntable test, which simulates the wear and tear of road markings under traffic conditions.

The turntable test involves subjecting the materials to millions of wheel passes to assess their skid resistance, erosion, and colour stability prior to actual road tests started. This type of testing evaluates the durability and performance of road markings under simulated traffic conditions.



The process involves:



Results from AETEC

Results from AETEC (Advanced Engineering Testing and Evaluation Centre) based on the European Standard EN 13197:2011+A1:2014

This standard specifies the requirements for the wear simulator test for road marking materials intended for both permanent and temporary use, including those with increased retroreflection under wet and rainy conditions.

Test Method:

The wear simulator test uses a turntable to evaluate the durability and performance of materials under simulated traffic conditions, replicating the wear and tear caused by vehicle tires over time. The test measures various parameters, including night-time visibility (luminance RL), daytime visibility (luminance Qd), skid resistance, and the type of road marking system.

Test Results:

The test results were completed on a road surface with an RG2 rating substrate, equivalent to NZTA M7 asphalt.

DURABILITY PERFORMANCE

- The EN 13197:2011+A1:2014 standard outlines various classes of durability performance for road marking materials, ranging from P0 to P7.
- These classes indicate the material's ability to withstand wear and tear over time, simulating the effects of traffic and environmental conditions.

Durability Classes:

1. **P0:** No requirement (10,000 wheel passes)
2. **P1:** Basic durability
3. **P2:** Moderate durability
4. **P3:** High durability
5. **P4:** Very high durability (500,000 wheel passes)
6. **P5:** Excellent durability (1 Million wheel passes)
7. **P6:** Superior durability (2 Million wheel passes)
8. **P7:** Maximum durability (4 Million wheel passes)

These classes help categorise the performance of road marking materials, ensuring they meet specific standards for longevity and effectiveness under various conditions. The higher the class, the better the material's performance in terms of durability and resistance to wear.

Comparison with NZTA M7 Standards:

1. **NZTA M7:** Specific to New Zealand, with durability criteria of 1.5 Million, 3 Million, and 5 Million vehicle passes, designated as Normal, Extended, and Long Life.
2. **EN 13197:2011+A1:2014:** Used in Europe, with durability classes ranging from P0 to P7.

NIGHT-TIME VISIBILITY (LUMINANCE RL)

- High night-time visibility is crucial for driver safety, especially on roads with low ambient light. Retroreflective road markings enhance visibility by reflecting headlights back to the driver, making it easier to see lane boundaries and other road markings at night. This reduces the risk of accidents caused by poor visibility.
- The EN 13197:2011+A1:2014 standard includes classifications for the night-time visibility of road markings under dry conditions, with R5 being one of the highest classes. This classification indicates excellent retroreflectivity, ensuring that road markings are highly visible to drivers at night.
- High night-time visibility is crucial for driver safety, especially on roads with low ambient light. Retroreflective road markings enhance visibility by reflecting headlights back to the driver, making it easier to see lane boundaries and other road markings at night. This reduces the risk of accidents caused by poor visibility.

Retroreflectivity Classes:

1. **R0:** No requirement
2. **R1:** Minimum retroreflectivity level (80 - 99 mcd/m²/lx)
3. **R2:** Moderate retroreflectivity level (100 - 149 mcd/m²/lx)
4. **R3:** High retroreflectivity level (150 - 199 mcd/m²/lx)
5. **R4:** Very high retroreflectivity level (200 - 299 mcd/m²/lx)
6. **R5:** Extremely high retroreflectivity level (300+ mcd/m²/lx)

Class R5 ensures maximum visibility (>300 mcd/m²/lx), crucial for driver safety, especially on high-speed roads and highways. At the end of the testing (P7, 4 million vehicle passes), the markings still performed at an R3 level (150 - 199 mcd/m²/lx). This figure meets the NZTA M7 requirements.

SKID RESISTANCE TESTING (SRT UNITS)

- Skid resistance is a measure of how well the road surface can prevent vehicles from skidding, especially in wet conditions. High skid resistance values are critical for maintaining traction and reducing the likelihood of accidents caused by skidding. This is particularly important for road markings at pedestrian crossings, intersections, and other high-risk areas.
- Skid resistance is measured using the Skid Resistance Tester (SRT), with results often expressed in British Pendulum Number (BPN). The S4 class indicates a minimum skid resistance value of 60 SRT units, ensuring surfaces meet safety standards for preventing skidding, especially in wet conditions.

Skid Resistance Classes:

1. **S0:** No requirement
2. **S1:** SRT ≥ 45 (BPN ≥ 45)
3. **S2:** SRT ≥ 50 (BPN ≥ 50)
4. **S3:** SRT ≥ 55 (BPN ≥ 55)
5. **S4:** SRT ≥ 60 (BPN ≥ 60)
6. **S5:** SRT ≥ 65 (BPN ≥ 65)

These values help in assessing and maintaining road safety by ensuring that surfaces provide adequate friction to prevent vehicle skidding.

NZTA M7 have criteria for skid resistance so S4/3 are higher than NZ standard.

Conclusion

- The AETEC testing results, based on the EN 13197:2011+A1:2014 standard, provide a comprehensive evaluation of road marking materials' durability and performance.
- These tests ensure that road markings maintain high visibility and skid resistance, contributing to overall road safety.
- Damar Instacure at 350 g/m² and Echostar HP AC02 glass beads at 250g/m² have given excellent results.



Advantages of Instacure

ENVIRONMENTALLY FRIENDLY

Instacure consists of 100% solids and has trace-only VOCs (volatile organic compounds). This makes it not only **safer for road workers to apply**, but it also **significantly reduces its impact on the environment**.

Traditional road marking systems often use materials that contain high levels of VOCs, which are known to have adverse health effects on workers and contribute to air pollution. By using Instacure, road maintenance **companies can reduce their environmental impact and promote a safer work environment for their workers**. This benefits the workers and the environment, and contributes to the sustainability of the road maintenance industry.

SAFETY ON THE ROADS

By using Instacure, road marking crews can significantly enhance the safety of their process.

Instacure shortens the curing time, and thus **reduces the exposure of personnel to potential dangers**. This leads to a lower number of personnel involved in hazardous situations and a decreased need for support vehicles and road cones, thus reducing disruptions to the public.

Instacure therefore represents a step towards a **safer and more efficient road marking process**.

ENHANCED VISIBILITY

UV coating provides a **high-quality retro reflectivity**, making road markings more visible especially in low-light conditions or bad weather, which **improves safety for drivers**.

DURABILITY

UV coating has **excellent durability and resistance to wear and tear**, resulting in longer-lasting road markings with a high night-time retro reflectivity. They require **less frequent maintenance** and improve safety whilst reducing inconvenience for road users.

SUPERIOR PERFORMANCE

Instacure's **retro reflectivity levels are higher** than other NZTA M7 paint systems, and it **lasts for considerably longer**.

FASTER APPLICATION

Instacure's UV coating **cures rapidly**, allowing road marking to be applied more efficiently – in turn **minimising disruption to traffic flow**.

Superior reflectivity.

The images below show how high retro reflectivity levels are for Instacure's UV coating compared to other NZTA M7 paint alternatives: They show both the high reflectivity of Instacure upon application and after a 12 month period:

New Instacure



Instacure after 1 Year



Legend: RL retro reflectivity night-time:



Superior reflectivity.

The graphics below show the reduction in retro reflectivity of NZTA M7 solvent paint over a 12 month period following application.

New NZTA M7 solvent paint:



NZTA M7 solvent paint after 1 Year:



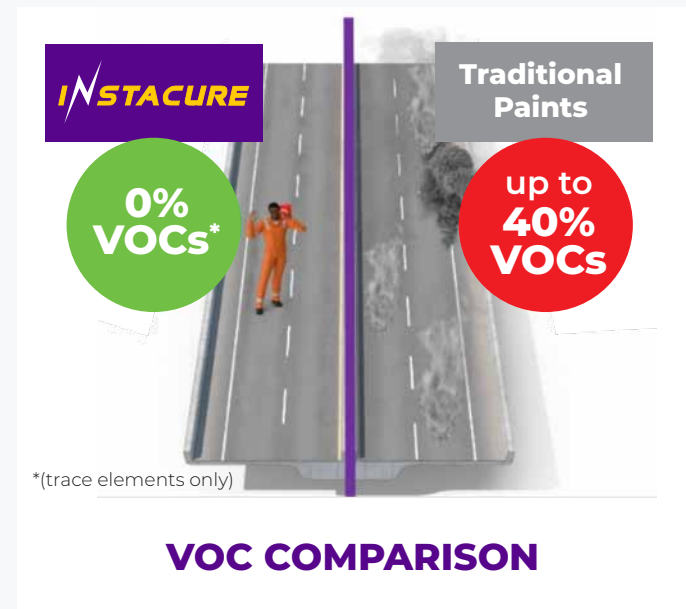
Legend: RL retro reflectivity night-time:



A more sustainable option

Because Instacure cures so quickly, virtually no VOCs go up into the atmosphere versus up to 40% in normal paints:

Product	Wet paint volume (litres)	Volume Solids (%)	Dry solid paint on road (litres)	VOC emitted into atmosphere (litres)
Solvent Acrylic	1,000	55	550	450
Solvent Alculine	1,000	60	600	400
Chlorinated Rubber	1,000	57	570	430
Solvent Acrylic	1,000	55	550	450
Chlorinated Rubber	1,000	57	570	430
Water Based	1,000	66	660	280L water 60L VOC
Instacure	1,000	100	1000	Very low VOC (Trace)



100% of Instacure goes onto the road, not into the atmosphere

Instacure is a safe and innovative road marking system that eliminates the need for heaters, boilers, or flames during the application process. This significantly reduces the risk to contractors and road users. Additionally, Instacure is neither solvent-based nor water-based and it is non-flammable, adding an extra layer of safety.

In contrast, traditional thermoplastic road marking systems require heating to temperatures between 180 to 220 degrees Celsius and must be maintained at this temperature during the application. This creates a potential safety hazard before, during and after the application, as accidents can occur due to the use of boilers or machines that are more susceptible to fire risk or the release of hot substances under pressure.

HIGHER PERFORMANCE WITH LOW CHEMICAL USAGE

Different countries set their own specifications, such as lifetime, thickness, anti-skid properties and retro reflectivity, but – generally – durable road markings are required for high-traffic areas where reflective properties are crucial.

Instacure represents a significant innovation in the road marking industry as it combines thin layer characteristics with the long-life, good reflection, and anti-skid properties of a durable system.

The fact that Instacure is a long-life product that only requires 220 microns of application is a major departure from traditional road marking systems, which typically require anywhere from 900 microns to 4000 microns for approved long-life performance.

Reduced carbon emissions

Instacure offers a unique advantage over traditional road marking systems in terms of carbon emissions reduction.

Unlike thermoplastic systems that require heating up of the material to apply, Instacure is applied cold, requiring significantly less energy consumption. Additionally, with Instacure, the number of vehicles required for application is reduced, resulting in further carbon emissions savings.

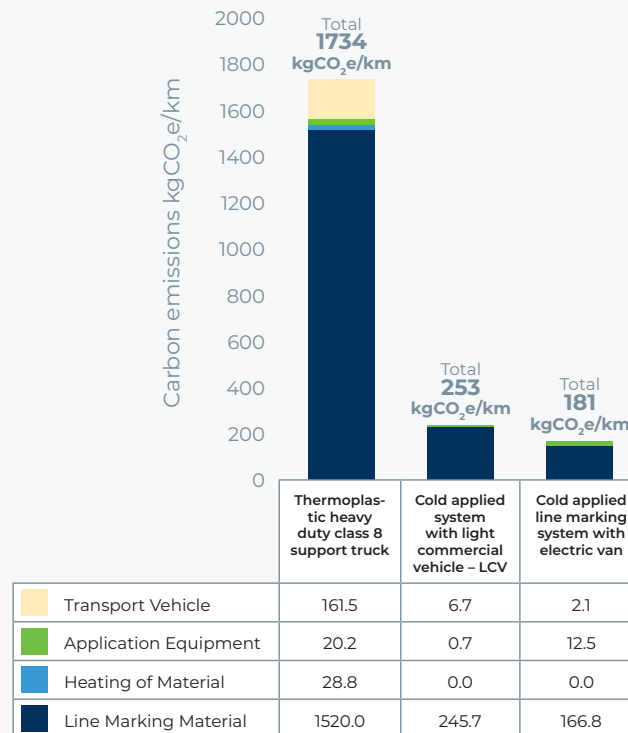
In comparison, thermoplastic systems require substantial amounts of energy to heat up the material, often requiring the use of fossil fuels. The process of heating up the material also requires specialised equipment, adding to the overall carbon footprint of the system. **By using Instacure, we can avoid these carbon emissions entirely.**

The first evidence suggests that Instacure could potentially emit up to 15% less carbon emissions than cold applied systems

This is due to its unique curing process that requires less energy and resources compared to traditional cold applied systems.

Further studies and analysis are needed to confirm these findings and to fully understand the environmental impact of Instacure compared to other road marking systems.

However, this early indication suggests that Instacure could be a promising solution for reducing carbon emissions and improving sustainability in road marking applications.



BACKED BY INITIAL STUDIES

A study conducted by the University of Alberta in Canada compared the carbon emissions of hot and cold applied line marking systems.

The study found that thermoplastic line marking systems have a significantly higher carbon footprint, with 87% of their carbon emissions coming from the high energy input required to prepare the raw materials. This leads to a high embodied carbon of 1520 kgCO₂e/km. Additionally, thermoplastic paint emissions are higher because the ingredients are derived from petroleum and contain calcium carbonate fillers and glass beads from energy-intensive aggregate industries.

Transport during line marking is also a significant contributor to the carbon emissions of thermoplastic line marking systems, accounting for 165 kgCO₂e/km due to the fuel consumption of heavy-duty trucks and truck idling. On the other hand, cold applied systems have lower carbon emissions due to their materials, with solvent-based acrylic paint resulting in 245.7 kgCO₂e/km of road marked, while MMA systems have a lower carbon impact of 166.8 kgCO₂e/km.

The full document is attached in appendixes

Shorter interruptions for contractors and road users

The use of traditional road marking systems poses challenge, such as extended curing times.

As a manufacturer, it is crucial to distinguish between a product that is dry (appearing dry but not fully cured) and one that is fully cured (completely dry). Some products may require up to 24 hours to reach full curing. During this period, traditional systems may encounter issues such as dirt accumulation, product failure, washout, or damage or loss of glass beads.

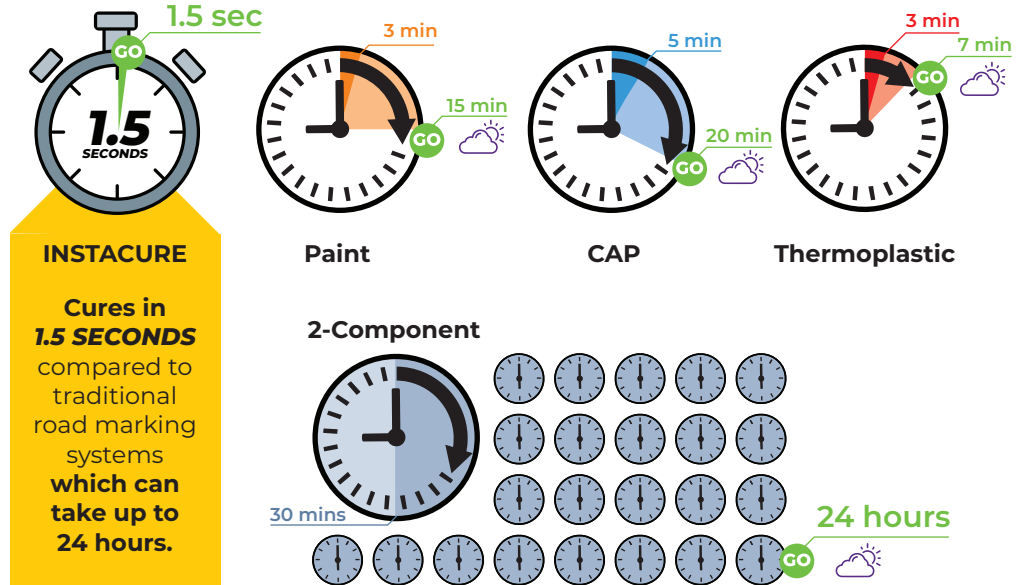
Instacure's UV technology is fully cured and trafficable within 1.5 seconds. Because Instacure is fully cured (not just dry, but completely cured) and traffic-ready in 1.5 seconds, the beads embed flawlessly (keeps better retro reflectivity and visibility), there is no dirt pick-up and no compromise in quality because of early exposure to traffic.

Furthermore, existing systems are dependent on weather conditions, and temperature highly influences the curing time. This extended wait period, coupled with susceptibility to damage from atmospheric conditions and traffic, intensifies the vulnerability of road workers and contractors to potential hazards on the road.

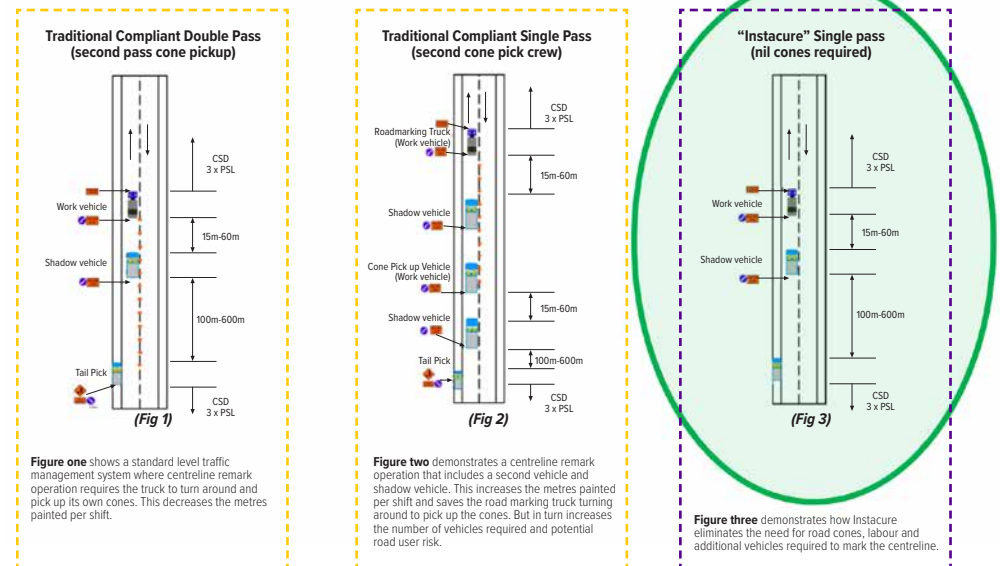
Smaller road operations, better safety

Instacure shortens the curing time and thus reduces the exposure of personnel to potential dangers. This leads to a lower number of personnel involved in hazardous situations and a decreased need for support vehicles and road cones, thus reducing disruptions to the public. The implementation of Instacure represents a step towards a safer and more efficient road marking process.

Curing Times



New Zealand example (with current available information)



1. New Zealand only example

Fewer cones needed



By reducing/minimising/eliminating the use of traffic cones used in roadworks, we can improve traffic flow, minimise road clutter, and enhance safety for both drivers and workers.

The absence of cones makes it easier for drivers to navigate, reducing confusion and the likelihood of accidents. Additionally, it helps maintain a clear and efficient work area, promoting faster project completion and reducing delays for commuters.

The next stage: road trials

Our team is committed to exploring innovative approaches to improve road safety on rural and urban roads, and we believe that Instacure can play a critical role in achieving this goal.

With the right support, we can conduct further road trials develop new strategies to make our roads safer and more sustainable for everyone.

Who will benefit from Instacure?

- 1. ROAD WORKERS:** With the introduction of Instacure, we can reduce the number of individuals on the road during roadwork activities. This reduction in personnel means that less time needs to be spent on the road, resulting in a safer and more secure environment for all road users, including road workers and motorists.
- 2. ROAD USERS:** While we have already seen significant benefits from Instacure, we believe that there is even more potential to be unlocked. Due to its instant curing capabilities, people on the road are exposed for a shorter amount of time, which can lead to further improvements in safety. Additionally, other road users will benefit from less interruption in traffic flow, resulting in fewer potential dangers on the road.
- 3. AUTHORITIES:** Instacure offers significant benefits in support of the vision of zero deaths and serious injuries on New Zealand roads.

By reducing the amount of interruption in normal traffic flow, there will be less potential for incidents and fewer casualties, which ultimately leads to a safer and more secure environment



for all road users. This will not only reduce the cost associated with incidents and accidents but also improve the overall efficiency of the road network.

By supporting the adoption of Instacure, authorities can demonstrate their commitment to ensuring the safety and well-being of their citizens and contribute to a more sustainable and secure transportation system.

The opportunity to get involved

Involved as a partner, you have the chance to:

IMPLEMENT INSTACURE ON RURAL ROADS AND URBAN REGIONS

VISIBILITY:

The enhanced retro reflectivity that Instacure provides, especially in low light conditions allows drivers to see the road layout clearly and react in a timely manner.

GUIDANCE:

High quality reflective road markings guide drivers by clearly indicating lane boundaries, curves, intersections and potential hazards. This reduces the likelihood of drivers inadvertently straying from their lane or missing important traffic cues.

REDUCTION IN ACCIDENTS:

Studies have shown that well maintained reflective road markings can significantly lower the incidence of collisions and fatalities.

PAINT LIFESPAN:

The longer life qualities of UV paint extend the lifespan of the application and extend the retro reflectivity period for the road.

MONITOR TO EVALUATE OVER AN AGREED PERIOD:

VISIBILITY & SAFETY

Evaluate, over an agreed period. Improved visibility and safety and accident reduction rates.

DURABILITY & WEAR

Check for degradation, due to weather. Check how well retro reflectivity maintains its effectiveness and maintenance activities.

DRIVER BEHAVIOUR

Observe changes in driver behavior, such as speed adjustments and lane discipline to determine if improved retro reflectivity influences safer driver practices.

COST EFFICIENCY/ EFFECTIVENESS

Analyse the cost effectiveness of the retro reflectivity improvements, including installation and maintenance and any reduction in accident-related costs.

Appendices

Case studies

The following are extracts from various studies related to the benefits of high retro reflectivity. The full case study for each is attached in the appendices:

1. The Investigation of Longitudinal Pavement Markings and Reflectivity and Safety by the Texas Transport Institute

This investigation concludes that having highly visible pavement markings is a high-ranking desire among the public.

2. Science Direct – Burghardt et al

Because horizontal road markings are inexpensive and effective safety features, they are one of the easy to implement solution sought for countries with disproportionately high accident rates.

3. Potters Technical Bulletin No.059

Line marking – A Fundamental of Basic Road Safety:

- If you are driving below the legal speed limit at night but cannot see which way the road goes; you (and others) are in danger;
- If you obey the advisory speed warning sign at night but can't clearly delineate where the bend in the road is; you (and others) are in danger;
- If road safety education has convinced you to indicate clearly when you are changing lanes but you can't see where the lanes are; you (and others) are in danger.

Furthermore, even if poor line marking does not lead to an accident at a specific location, navigating your way on a road with limited or no delineation can create additional stress and fatigue for the driver, which could lead to an accident.

4. Potters Technical Bulletin No.109

Brighter Markings - Are they safer?

End-of-line-detection distances are affected by age. Zwahlen (1998) conducted a study assessing end-detection distances with different types of pavement markings and different illumination conditions with younger (average age 23) and older drivers (average age 68). End-detection distances were 55% higher for the younger age group.

Although both retro reflectivity and headlamp illumination influenced end-detection distance, retro reflectivity had more effect. This indicates that improving night time visibility of edge and centre lines cannot be achieved solely by providing greater illumination of the roadway.

The physical properties of the markings themselves are also of great importance in determining visibility.

5 Exploring Carbon Emissions. Study by University of Alberta, Canada

6. Road services driveover (Google doc)





INSTACURE

THE ROAD SAFETY GAME CHANGER



**SCAN to view
a short video**
on how Instacure
is a game-changer
in Road Marking
Systems.



CONTACT

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