



*Una manera de hacer Europa*

# BUENAS PRÁCTICAS Actuaciones Cofinanciadas

"Reinforcement of the B-224 Road Surface: Capellades - Piera Section"

Generalitat de Catalunya  
Departament de la Vicepresidència i del Polítiques Digitals i Territori

## Programa Operativo de Catalunya

Año 2021

Fondo Europeo de Desarrollo Regional



## **The "Reinforcement of the B-224 Road Surface: Capellades - Piera Section" project is presented as a good practice**

The project "Reinforcement of the B-224 road surface: Capellades - Piera Section" is one of a number of actions that strengthen research, technological development and innovation, aimed at promoting the incorporation of new materials and sustainable technologies in the design, production, construction and maintenance of road surfaces by the Generalitat de Catalunya. This is an Innovative Public Procurement (CPI) project, a category of administrative action intended to encourage innovation through public procurement, with the acquisition of new goods and services launched on the market for the first time.

The operation consists of introducing new methods and procedures in road surfaces, making them more environmentally sustainable, reducing the cost of processes from material production to surface maintenance, thereby providing value added to its basic road safety function.

In addition to the engineering tasks involved in drafting the construction project, the work includes analysing the condition of the road surface and the containment, signage and reflective elements, with the aim of detecting defects and determining necessary actions. It also requires the definition and collection of the data required to analyse the built surfaces and their life cycle, as well as establishing a waste management plan.

The scope of the project covers the B-224 road (from kilometre point 1+920 to 10+650) in the municipalities of Capellades, Vallbona d'Anoia and Piera, with a traffic volume of 5,635 vehicles a day, of which 3.63% are heavy vehicles, according to the 2016 data collected in the construction project.



Section of the operation between Capellades and Piera (province of Barcelona)

The project involves a total cost, eligible for subsidy, of €1,299,200 and ERDF funding of €649,600.





Taking into account the entire process (manufacture, transport and laying), the mixtures used in this type of surface **have reduced CO<sub>2</sub> (kg) emissions by 24.92%** compared to conventional mixtures, leading to total savings of 26.54 tonnes of CO<sub>2</sub> emissions, while also reducing **energy consumption (J/t) by 24.61% and fuel consumption (diesel) by 21.51%**, compared to conventional mixtures.

**This operation is presented as a good practice because it meets the following criteria:**

- 1. The role of the ERDF in the action has been adequately explained to its beneficiaries, potential beneficiaries and the general public**

The operation has been adequately publicised through the following actions:

**Construction site signs** installed at different sections during the project execution:



**Description of the operation on the beneficiary's website:**

**gencat**  
Territori

Inici | Departament | Mobilitat | Territori i urbanisme | Tràmits | Acció

Inici > Departament > Actuacions i obres > Acció exterior i projectes europeus > Projectes europeus i perfil propi a Europa  
Programa operatiu del Fons Europeu de Desenvolupament Regional (FEDER) 2014-2020 > Objectiu temàtic 1: Potenciar la Compra pública innovadora (CPI). Forns sostenibles. Millora del ferm a la carretera B-224. Tram: Capellades- Piera.

## Compra pública innovadora (CPI). Forns sostenibles. Millora del ferm a la carretera B-224. Tram: Capellades- Piera

L'objectiu de l'actuació és introduir nous mètodes i procediments als fons de les carreteres que els fa sostenibles a nivell econòmic i ambiental, aportant nous valors afegits a la seva funcionalitat bàsicament seguretat viària.

La tècnica innovadora de rehabilitació de fons es basa en l'aplicació de metodologies de fabricació posada en obra de mesclures bituminoses a menor temperatura que les mesclures bituminoses convencionals.

S'avaluarà l'actuació per tal de confirmar la seva sostenibilitat, i es compararà el comportament de l'innovador amb un ferm convencional.

Fitxa de l'actuació:

Beneficiari	Generalitat de Catalunya. Departament de Territori i Sostenibilitat
Executor	Departament de Territori i Sostenibilitat. Direcció General d'Infraestructures de Mobilitat
Prioritat d'inversió	PI.1.2. Foment de la inversió empresarial en R+D, el desenvolupament de vincles i sinergies entre les empreses, els centres d'investigació i desenvolupament i el sector d'ensenyament superior, en particular mitjançant el foment de la inversió en el desenvolupament de productes i serveis, la transferència de tecnologia, la innovació social, la innovació ecològica, les aplicacions de servei públic, l'estímul de la demanda interconnexió en xarxa, les agrupacions i la innovació oberta a través d'una especialització intel·ligent, i mitjançant el suport a la investigació tecnològica i aplicacions pilot, accions de validació precorrelació dels productes, capacitats de fabricació avançada i primera producció, en particular, a tecnologies facilitadores essencials i difusió de tecnologies polivalentes. Foment d'estratègies de reducció del carboni per a tot tipus de territori, especialment les zones urbanes, inclosos el foment de la mobilitat urbana multimodal sostenible i les mesures d'adaptació amb efecte de mitigació
Objectiu	OE.1.2.1. Impuls i promoció d'activitats d'R+D liderades per les empreses, suport a la



**Press releases** posted on the website of the Generalitat de Catalunya at different times during the project execution, as well as the publication of the results of the open market consultation held to obtain proposals for innovative surface, in which several companies and organisations participated:

Generalitat de Catalunya  
Departament de Territori  
i Sostenibilitat

Unió Europea  
Fons Europeu  
de Desenvolupament Regional

Comunicat de premsa

### Territori i Sostenibilitat licita dues obres de millora de ferm que incorporen tecnologies sostenibles

- Els treballs sumen una inversió total prevista de 2,7 MEUR i es duran a terme a la B-244, entre Capellades i Piera, i a la TP-7013, entre Alforja i la Selva del Camp
- Les actuacions formen part del Programa de compra pública d'innovació de la RIS3CAT, que vol potenciar la innovació com a clau per impulsar l'economia i la competitivitat

El Departament de Territori i Sostenibilitat ha obert la licitació de dues actuacions de rehabilitació i millora de ferms que incorporen noves tècniques i materials sostenibles, mitjançant una compra pública d'innovació (CPI). Aquestes obres, amb una inversió prevista total de 2,7 MEUR, s'emmarquen en l'Estratègia de recerca i d'innovació per a l'especialització intel·ligent (RIS3CAT) del Govern de la Generalitat, que compta amb cofinançament del Programa operatiu FEDER de Catalunya 2014-2020.

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Comunicat de premsa

### Una vintena d'empreses i entitats presenten unes 200 propostes per incorporar tecnologies sostenibles als ferms de les carreteres catalanes

- Les indicacions fan referència a tècniques, metodologies, seguiment de la qualitat, transport de productes o sistemes de contractació
- És la primera iniciativa del Programa de compra pública d'innovació de la RIS3CAT, que vol potenciar la innovació com a clau per impulsar l'economia i la competitivitat d'un país



**Media publicity (radio):** Interview with Xavier Flores, Director General for Mobility Infrastructures, on Catalunya Radio:

CATALUNYA RÀDIO

NOTÍCIES ESPORTS CULTURA EL TEMPS DIRECTES A LA

alacarta

BUSCA ÀUDIOS I VÍDEOS: Per hora a hora Per programes Per col·leccions

GREEN

00:09:08

METEOMAURI

Screenshot of the radio announcement

The interview is available [on the Corporació Catalana de Mitjans Audiovisuals website](#)

## 2. The project incorporates innovative elements

This operation is clearly innovative. The solution used on these new surfaces is a warm bituminous mixture (of aggregates (stone) and bitumen, commonly known as asphalt), with a wearing course thickness of 3 cm. This type of mixture has numerous advantages over conventional ones, related to both the actual process of laying the surface and its life span and to the mixture temperature, lower energy consumption and lower environmental impact.

The use of this new type of surface, in which an additive in the bitumen allows the mixture to be laid and compacted at lower temperatures, produces energy savings in manufacturing and a reduction in greenhouse gas and suspended particulate matter emissions. Furthermore, the surface life span is extended, as there is less oxidation of the bitumen in the manufacturing process.

This innovative mixture can also be transported longer distances without jeopardising its malleability, as it leaves the plant at a lower temperature and is thus less affected by ambient temperature.

On site, risks to workers are reduced as they are not exposed to high temperatures, vapours and fumes.

Thus, using this new type of mixture means **less energy is consumed** throughout the life cycle and less energy is needed to heat the aggregates, thus reducing fossil fuel consumption in the process. In addition, the whole process and use of this new surface helps **reduce atmospheric CO<sub>2</sub> emissions and the carbon footprint**.

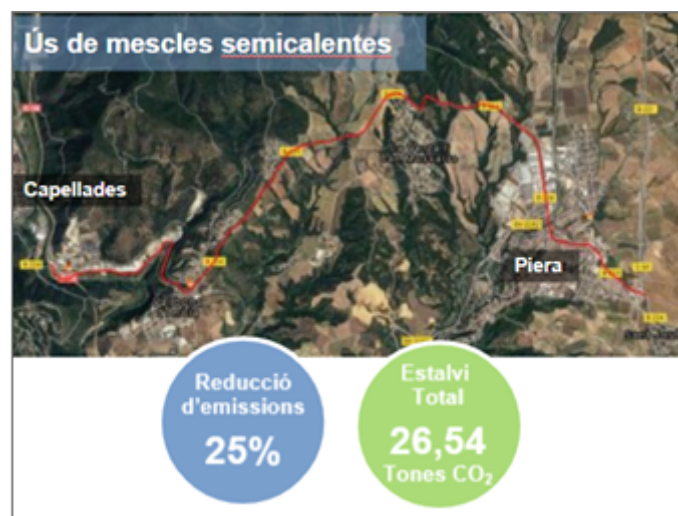


*Laying work*

### 3. Match of the results to the set objectives

The introduction of new methods and procedures for road surfaces has been aimed at producing greater environmental sustainability while reducing costs, from the production of materials to surface maintenance, and improving road safety.

According to the *Study on environmental indicators of sustainable surface works*, the manufacture, transport and laying of warm bituminous mixtures has led to a **decrease in the carbon footprint** from the product life cycle, CO<sub>2</sub> emissions, **and energy and fuel consumption**.



In financial terms, the new mixtures and techniques also improve costs throughout the process. Firstly, as the bitumen ages less, the surface durability increases, thus reducing material consumption and road maintenance costs. Secondly, the mixtures can be applied over longer periods of the year and working hours, as they are less dependent on ambient temperature.

In terms of road safety, consideration has been given to ensuring that the innovative materials and techniques used in the operation are functionally suitable for driving and provide an adequate response between the surface and the vehicle wheel in such situations as braking in rainy conditions, among others.

Life-cycle monitoring of the new surfaces will continue for a period of five years in order to analyse the results in terms of property maintenance, function and sustainability. The same innovative techniques/solutions will also be tested in different environments (weather conditions, traffic volume, etc.) to obtain a broader understanding of the surface behaviour.



#### **4. Contribution to solving a problem or weakness detected in the regional scope of execution**

Adequate environmental conservation and the commitments acquired for adapting to climate change mean initiatives that favour sustainable processes in infrastructure management, in general, and in the construction or restoration of road surfaces, in particular, must be given consideration.

In this context, the operation identifies **environmental challenges** that need addressing to prevent long-term irreversible environmentally damaging situations.

These challenges pursue environmental sustainability by reducing greenhouse gas emissions during the manufacture, transport and commissioning processes and the life-cycle carbon footprint (reducing the temperature throughout the process reduces CO<sub>2</sub> emissions and energy and fuel consumption).

Furthermore, the greater durability of materials and the longer surface life cycle means material consumption and related costs are reduced.



Mixture laid in one of the sections of the operation

The project has also identified other challenges to be met by future innovative solutions, such as introducing the circular economy (reducing the consumption of 'natural' materials by using products made from reused or recycled materials).

#### **5. High degree of coverage for the target population**

In general terms, the operation has had a positive impact on the area, especially in the municipalities closest to the improved roads, between Capellades and Piera.

Everything from the manufacture of the mixtures to maintenance of the improved surfaces requires the use of materials and facilities close to the roads undergoing improvement,

which both reduces the project and maintenance costs and boosts participation by local companies, working appropriately in the different stages of the surface cycle.

In terms of road safety, which has improved as a result of the laying of the new surfaces, the project has directly benefited the 6,038 vehicles a day<sup>1</sup> on the section of the B-224 between Capellades and Piera, of which 4.42% are heavy vehicles.

Finally, sustainable surfaces improve the working conditions for the workers who have to spread the mixture. Since the innovative mixtures require lower temperatures than conventional ones, they are easier and more convenient to work with and generate less suspended particulate matter. The mixtures can also be applied over longer periods of the year and working hours, as they are less dependent on ambient temperature.

## **6. Consideration of horizontal criteria of equal opportunities and non-discrimination, as well as social responsibility and environmental sustainability**

Environmentally, this operation is strongly committed to the principle of sustainable development. One of the main objectives in the construction and restoration of Catalan road surfaces is to contribute to reducing gas emissions that negatively affect climate change, improve efficiency in the use of resources and reduce the carbon footprint caused by the surface life cycle. In addition, the innovative solutions proposed in the operation help increase the durability of the product, thereby lengthening the life cycle of the surfaces and reducing the consumption of materials.

Regarding compliance with the horizontal principles of equality between men and women and non-discrimination, all phases of the project (preparation and execution) comply with regulations on effective equality of women and men and obligations related to the promotion of equality between men and women and non-discrimination on the basis of sex, ethnic origin, religion and beliefs, disability, age and sexual orientation. It also complies with the protocol for the prevention, detection, action and resolution of situations of sexual harassment based on sex, sexual orientation and/or sexual identity in the Generalitat de Catalunya.

## **7. Synergies with other public intervention policies or instruments**

The project is covered by the Sector Plan for Sustainable Road Surfaces (PSFS), defined as the set of actions to promote the incorporation of new materials and new sustainable technologies in the design, production, construction and maintenance of road surfaces for the roads of the Generalitat de Catalunya.

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<sup>1</sup> Latest traffic data, from 2017, measuring the intensity and volume of vehicles



Both the project and the plan are associated with the Catalan Research and Innovation Strategy for Smart Specialisation (RIS3CAT) Public Procurement of Innovation (PPI) Programme, which defines the priorities for public RDI policies and the actions given support by the 2014-2020 ERDF Operational Programme for Catalonia.

The operation is also aligned with Catalonia's Green Agenda, which is modelled on the approach adopted by the European Union Green Deal for green economic recovery. This is the country's main strategy for sustainable economic growth until 2030 and is based on the efficient use of resources, modernisation of the productive sectors, protection of nature and greater climate ambition. Its aim is to achieve a more sustainable, prosperous, resilient and equal society.

In addition, the Road Surface Programme is linked to the strategic operating axis in the Strategic Management and Continuous Improvement Plan (PEGEMC) for the Generalitat de Catalunya road network, which includes all the activities of replacing and improving surfaces, with the general aim of maintaining adequate conditions of traffic safety and convenience.

Finally, the project presents numerous potential synergies with actions planned for the territory in the context of the European Union Horizon 2020 research and innovation funding programme.





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# BUENAS PRÁCTICAS

## Actuaciones Cofinanciadas

**Fondo Europeo de Desarrollo Regional**