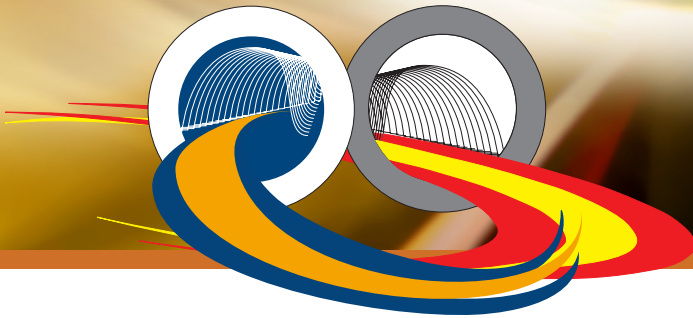


PIARC

2nd INTERNATIONAL CONFERENCE ON ROAD TUNNEL OPERATIONS AND SAFETY & VIII SPANISH TUNNELS SYMPOSIUM



25th-28th October 2022

Congress Palace • Granada, SPAIN

Road Tunnels Committee

ORGANIZED BY:



SUPPORTED BY:



COLLABORATE
WITH:

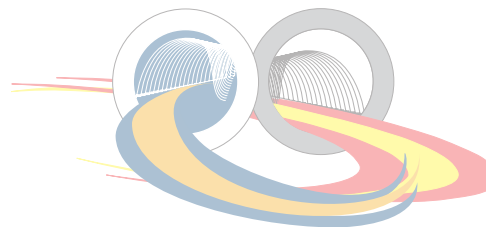


BULLETIN No. 2



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PRESENTATION

Following the success of the 1st PIARC International Conference on Tunnels held in Lyon, France, in October 2018, PIARC and the Spanish National Committee (ATC) will jointly organize the 2nd International Conference on Tunnels and the VIII National Symposium on Tunnels in October 2022 in Granada, Spain. This joint event will bring together the knowledge and exchange of international experiences of PIARC in this matter together with the traditional Spanish symposium organized by the ATC every four years. We hope to bring together nearly 1,000 road tunnel professionals from the world to generate a global discussion on the topic.

PIARC is an apolitical and non-profit association, one of whose main objectives is the transmission of knowledge and the exchange of experiences on roads. Its Work Programs are organized in four-year cycles marked by the World Road Congresses. The framework for the development of these objectives is the Technical Committees, being that of Road Tunnels, previously called Tunnel Operation, one of the most active. Since 1995 he has published 48 documents in addition to an online Manual and numerous articles in the Routes / Roads magazine. For this reason, in October 2018 the initiative was taken to organize an international Conference on Tunnels that was held in Lyon and which was a great success of participation. This has encouraged the convening of a 2nd Conference, this time in Spain, which will mean its consolidation.

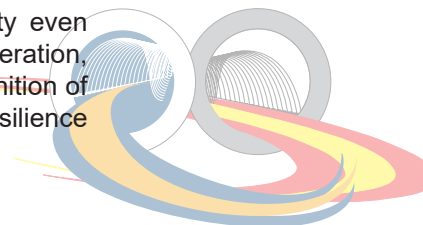
Faced with the new challenges of climate change, a sustainable economy and within the framework of Covid 19, it makes sense to speak of resilient infrastructures, a concept also applicable to tunnels. In this way, tunnels must present high availability rates with an acceptable level of safety even under circumstances that involve significant alterations to normal operation, establishing measures to reduce impacts. This will also imply the redefinition of the design and management standards and integrate the concept of resilience into the life cycle.

On the other hand, the road transport sector is experiencing a technological revolution with the challenges of digital transformation. Phenomena such as the autonomous vehicle, shared vehicles, digital mobility platforms, electrification, and the new energies for propulsion of vehicles are realities on which we must already work due to their direct relationship in the way of management and operation of tunnels. The ITS systems and their continuous development also have a lot to say about all these issues. Other important issues are the management of large urban tunnels, as well as, in general, the ventilation and lighting of the tunnels and their constant progress.

The celebration of this 2nd international conference, coinciding with the VIII National Symposium of Tunnels of Spain, will allow to expose the state of the art of all these novel topics and be a forum for feedback and exchange of ideas that will allow to continue investigating modelling the tunnels facing the challenges that in a few years will be present and will be normal in our infrastructures.

Rafael López Guarga

CHAIRMAN OF THE TUNNEL TECHNICAL COMMITTEE OF THE TECHNICAL ROAD ASSOCIATION
TECHNICAL DIRECTOR OF SYMPOSIUM



HONORARY COMMITTEE (Proposal)

- Co-Chairman: **Mr. Juan Manuel Moreno Bonilla**
Presidente de la Junta de Andalucía
- Ms. Raquel Sánchez Jiménez**
Ministra de Transportes, Movilidad y Agenda Urbana
- Members: **Mr. Francisco Cuenca Rodríguez**
Alcalde de Granada
Ayuntamiento de Granada
- Ms. Isabel Pardo de Vera Posada**
Secretaria de Estado de Transportes, Movilidad y Agenda Urbana
- Mr. José Entrena Ávila**
Presidente de la Diputación Provincial de Granada
- Mr. Xavier Flores García**
Secretario General de Infraestructuras
Ministerio de Transportes, Movilidad y Agenda Urbana
- Mr. Nazir Alli**
Presidente de PIARC
- Ms. Marifrán Carazo Villalonga**
Consejera de Fomento, Infraestructuras y Ordenación del Territorio
de la Junta de Andalucía
- Mr. Francisco Javier Herrero Lizano**
Director General de Carreteras. Ministerio de Transportes,
Movilidad y Agenda Urbana. 1^{er} Delegado español en PIARC
- Ms. María del Rosario Cornejo Arribas**
Presidenta de la Asociación Técnica de Carreteras

ORGANIZING COMMITTEE

- Co-Chairman: **Mr. Francisco Javier Herrero Lizano**
Director General de Carreteras. Ministerio de Transportes,
Movilidad y Agenda Urbana. 1^{er} Delegado español en PIARC
- Mr. Patrick Mallejacq**
Secretario General de PIARC
- Members: **Mr. Enrique Catalina Carmona**
Director General de Infraestructuras de la Junta de Andalucía

Mr. Álvaro Navareño Rojo

Subdirector General de Conservación
Ministerio de Transportes, Movilidad y Agenda Urbana

Mr. Miguel Caso Flórez

Director Técnico de PIARC

Mr. Salvador Fernández Quesada

Jefe de la Demarcación de Carreteras del Estado en Andalucía
Oriental. Ministerio de Transportes, Movilidad y Agenda Urbana

Mr. Juan Manuel Medina Torres

Decano de la Demarcación del Colegio de Ingenieros de Caminos,
Canales Y Puertos en Andalucía

Mr. Rafael López Guarga

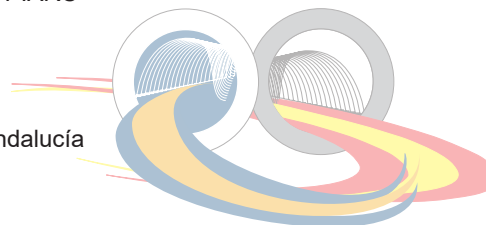
Jefe de la Demarcación de Carreteras del Estado en Aragón
Presidente del Comité de Túneles de la Asociación Técnica de
Carreteras. Secretario hispanohablante del Comité TC 4.4 de
PIARC

Mr. Alberto Bardesi Orúe-Echevarría

Director General de la Asociación Técnica de carreteras

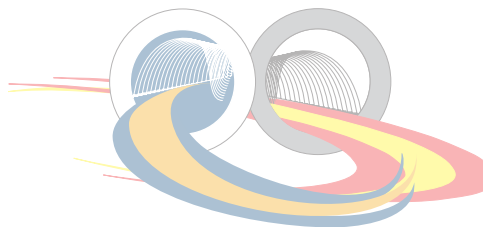
TECHNICAL COMMITTEE

- President: **Mr. Rafael López Guarga**
Director Técnico del Simposio
Presidente del Comité de Túneles de la Asociación Técnica de
Carreteras. Secretario hispanohablante del Comité TC 4.4 de
PIARC
- Vowels: **Mr. Ingo Kaundinya**
Presidente del Comité Técnico TC 4.4 de PIARC
- Mr. Ignacio del Rey Llorente**
Miembro y expresidente del Comité Técnico TC 4.4 de PIARC
- Mr. Jorgen Holst**
Miembro del Comité Técnico TC 4.4 de PIARC
- Mr. Bijan Khaleghi**
Miembro del Comité Técnico TC 4.4 de PIARC
- Mr. Fathi Tarada**
Miembro del Comité Técnico TC 4.4 de PIARC



GRANADA 2022

<p>Chairman:</p>	<p>Chairmanship: Mr. Javier Herrero Lizano <i>Director General de Carreteras</i> <i>Ministerio de Transportes, Movilidad y Agenda Urbana</i></p>	<p>15,00 - 15,20</p>	<p>Lecture: “Limiting nuisance for traffic during the refurbishment of the Heinenoord Tunnel; in search of resilience possibilities” Mr. Ronald Mante <i>Rijkswaterstaat, Ministry of Infrastructure and Water Management</i></p>
<p>Co-Chairman:</p>	<p>Mr. Patrick Mallejacq <i>Secretario General de PIARC</i></p>	<p>15,20 - 15,40</p>	<p>Lecture: “Seismic And Tsunami Resilience Assessment of Roadway Tunnels In Earthquake Prone Regions” Mr. Bijan Khaleghi <i>Saint Martin’s University</i></p>
<p>12,00 - 12,20</p>	<p>Lecture: “Future challenges for tunnel safety and operation from the perspective of PIARC’s Tunnel Committee” Mr. Ingo Kaundinya <i>Chairman of PIARC TC 4.4</i></p>	<p>15,40 - 16,00</p>	<p>Lecture: “Influencias admisibles de los túneles sobre la sostenibilidad medioambiental y socioeconómica de los acuíferos atravesados” Mr. César Fernández - Nespral Pérez <i>Dirección General de Carreteras. Ministerio de Transportes, Movilidad y Agenda Urbana</i></p>
<p>12,20 - 12,40</p>	<p>Lecture: “Túneles de futuro. Objetivo 2030” Mr. Rafael López Guarga <i>Presidente del Comité de Túneles de la ATC y Secretario hispanohablante del Comité TC 4.4 de PIARC</i></p>	<p>16,00 - 16,30</p>	<p>Discussion</p>
<p>12,40 - 13,00</p>	<p>Lecture: “Desafíos para la optimización en el proyecto de sistemas de ventilación” Mr. Ignacio del Rey Llorente <i>TYPSA</i></p>	<p>16,30 – 18,45</p>	<p>Open communications on the topic</p>
<p>13,00 - 13,20</p>	<p>Lecture: “Recomendaciones para las aproximaciones y zonas de bocas de túneles para aumentar la resiliencia y facilitar la construcción y la explotación de los túneles” Mr. Manuel Romana García <i>Universidad Politécnica de Madrid</i></p>		<p>“Condiciones Mínimas de Explotación (CME)” Mr. José Ramón Ochoa Vega <i>AECOM</i></p>
<p>13,20 - 13,45</p>	<p>Discussion</p>		<p>“La importancia de la resiliencia en el equipo humano” Mr. Juan Torres García <i>EMESA</i></p>
<p>13,45</p>	<p>Working lunch</p>		<p>“Implementation of low-tech and lean-tech concepts in road tunnels for a better sustainability” Mr. Olivier Martinetto <i>EGIS Structures et Environnement</i></p>
<p>15,00 - 18,45</p>	<p>SECOND SESSION: “Operation and sustainable management of tunnels” (Split into two rooms)</p>		<p>“Análisis del incendio en el Túnel de Folgoso. Gestión, reparación y reapertura” Mr. José Manuel Piris Ruesga <i>Ministerio de Transportes, Movilidad y Agenda Urbana</i></p>
	<p>• ROOM 1: “Resilience in tunnels”</p>		<p>“Resilience of german road tunnels and the macroeconomic evaluation of their availability” Mr. Ulrich Bergerhausen <i>German Federal Highway Research Institute (BAST)</i></p>
<p>Chairman:</p>	<p>Chairmanship: D. Álvaro Navareño Rojo <i>Subdirector General de Conservación</i> <i>Ministerio de Transportes, Movilidad y Agenda Urbana</i></p>		
<p>Co-Chairman:</p>	<p>Mr. Arild Søvik <i>Miembro del Comité TC 4.4 “Túneles” de PIARC</i> <i>Steering Board Member of ITA-Cosuf</i></p>		



“Nuevo túnel, soterramiento de un tramo de la Autovía A-5 en Madrid”

Ms. M^a Dolores Ortiz Sánchez / Mr. Carlos García Acón
Ayuntamiento de Madrid / Esteyco

“Definition of Harmonised Operational Guidelines to Deal with Chemical Risks in a Cross-Border Tunnel. Case study outputs from the TRANSTUN project.”

Mr. Andrea Micozzi
University of Rome Tor Vergata, Rome, Italy

“Resiliencia en los túneles de carretera”

Mr. David Zamora Martínez
Independiente

• ROOM 2: “Contribution of ITS to the improvement of tunnel operation”

Chairmanship:

Chairman: Ms. Isabel Blanco Bergareche
*Subdirectora Adjunta de Circulación
DGT. Ministerio del Interior*

Co-Chairman: M. Jean-Claude Martin
Secretario francófono del Comité TC 4.4 “Túneles” de PIARC

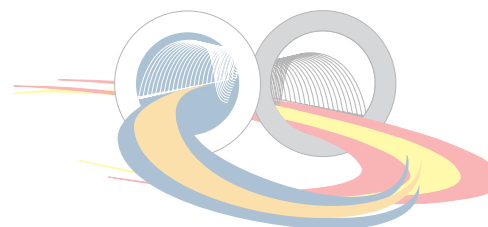
15,00 - 15,20 **Lecture: “El reto de la renovación del Centro de Control de los túneles de Calle30 (Madrid) sin afecciones a los usuarios”**
Mr. Javier Berges Redondo
Calle 30

15,20- 15,40 **Lecture “KITT - Artificial Intelligence to Improve the Safety of Tunnels and Tunnel Control Centers”**
Ms. Anne Lehan
German Federal Highway Research Institute (BASt)

15,40- 16,00 **Lecture: “Nueva tecnología de señalización de alta visibilidad en túnel”**
Mr. Luis Ayres Janeiro
API MOVILIDAD S.A

16,00 - 16,30 **Discussion**

16,30 - 18,45 **Open communications on the topic**



“Regulación de la velocidad en túneles”

Mr. Cristina Zamorano Nicolás
ABERTIS AUTOPISTAS ESPAÑA

“PLATUN: Plataforma Digital de Gestión Integrada de Túneles”

Mr. Vicente Sebastián Alapont
ELECTRONIC TRAFIC S.A.

“Safe Systems approach to enhancing tunnel safety and operations”

Mr. Dave Dollan
VSP

“Sistemas inteligentes para la detección de infracciones de tráfico. Ejemplo del túnel de Bielsa-Aragouet.”

Mr. Andrés Olloqui Martín
Empresa Pública

“Caso de éxito: el túnel de Cereixal, primer túnel conectado en España”

Ms. Teresa Santamera Oviedo
SICE

“ITS Technology Evolution in Tunnel Safety”

Mr. Hossein Parsa
Transurban

“Vehículos conectados y autónomos (CAV) a través de los túneles (2018-2021)”

Mr. Iván Ricondo Zaldivar
TEKIA

“Plataforma de simulación para entrenamientos de operadores”

Mr. Fco. Javier Cabrerizo Fuentes
ACEINSA MOVILIDAD-INTELIA

“Diseño y Desarrollo de un Sistema de Gestión de Túneles en servicio mediante la integración, aplicación y análisis de la metodología BIM (BIMEXTUNEL)”

Mr. Pedro Yarza Álvarez / Mr. Zacarías Barcenilla Torres
Alauda Ingeniería

“¿Están los túneles preparados para el tránsito de vehículos autónomos y conectados?”

Mr. Vicente Sebastián Alapont
ELECTRONIC TRAFIC S.A

“Cooperative Systems in Road Tunnels. Potentials using C2X communication for tunnel monitoring”

Mr. Georg Mayer
BUNG GmbH

21,30 **Official Conference Opening Dinner**

Wednesday, October 26

08,30 - 11,00 **THIRD SESSION:**
“Management of urban and highly trafficked tunnels”

Chairmanship:

Chairman: **Ms. Rosalía Gonzalo López**
Consejera Delegada CALLE 30

Co-Chairman: **Mr. Ricardo Miranda**
Miembro del Comité TC 4.4 “Túneles” de PIARC

08,30 - 08,50 **Lecture: “PIARC collection of case studies maintenance and traffic operation of heavy trafficked road tunnels”**
Mr. Arthur Kabuya
Primer Ingeniero. Gestión e Inspección Bruselas Movilidad Servicio Público Regional de Bruselas

08,50 - 09,10 **Lecture: “Diseño de un túnel para mejorar las condiciones ambientales del entorno”**
Mr. Juan Manuel Sanz Sacristán
SENER

09,10 - 09,30 **Lecture: “La complejidad de la explotación en una infraestructura de grandes dimensiones”**
Mr. Sergio Barral García
Calle 30

09,30 - 10,00 **Discussion**

10,00 - 11,00 **Open communications on the topic**

“Diseño de túneles urbanos”

Mr. Andreu Estany i Serra
Esteyco

“Fonctionnement en mode dégradé d’un poste de contrôle-commande assurant la surveillance de plusieurs tunnels”

Mr. Jean-Claude Martin
Centre d’Etudes des Tunnels

“Plan Málaga Litoral: Eje Litoral Soterrado”

Mr. José Pedro Alba García
ARCS Estudios y Servicios Técnicos S.L.

“El diseño de la movilidad en los túneles urbanos”

Mr. David Soler Grima
DOYMO

“Building Information Modelling for an optimized and safe operation of road tunnels”

Mr. Goetz Vollmann
Ruhr-University Bochum, Institute for Tunnelling and Construction Management
Steering Board Member of ITA

11,00 - 11,30 **Coffee break**

11,30 - 14,00 **FOURTH SESSION:**
“New vehicle propulsion energies and their impact on road tunnels”

Chairmanship:

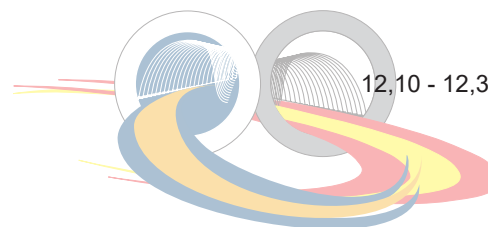
Chairman: **Mr. Ingo Kaundinya**
Presidente del Comité TC 4.4 “Túneles” de PIARC

Co-Chairman: **Mr. Enrique Catalina Carmona**
Director General de Infraestructuras de la Junta de Andalucía

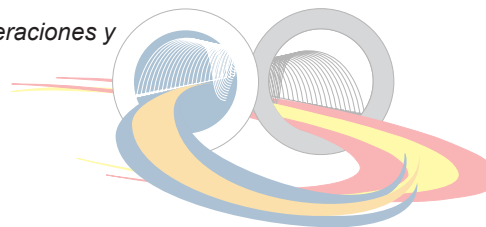
11,30 - 11,50 **Lecture: “Impact of new Energy carriers on tunnel design and safety - status report of PIARC TC 4.4 WG4”**
Mr. Peter Sturm
Graz University of Technology

11,50 - 12,10 **Lecture: “Quantitative risk assessment approaches for new vehicle propulsion energies in road tunnels”**
Mr. Bernhard Kohl
ILF Group Holding

12,10 - 12,30 **Lecture: “El vehículo eléctrico también contamina”**
Mr. Ramón Morera Fauquier
INNOVIA



12,30 - 13,00	Discussion	15,00 - 15,20	Lecture: “La gestión de la información en los accidentes en túneles” Mr. Emilio Leo Ferrando <i>Subdelegación del Gobierno en Huesca. Unidad de Protección Civil</i>
13,00 - 14,00	Open communications on the topic “Pollutants from fire tests with battery electric vehicles and their impact on road tunnels” Mr. Patrik Föbtleitner <i>Graz University of Technology</i> “Instalación de puntos de carga eléctrica en túneles de carretera” Mr. Alberto Cuadrado Madrona <i>IDOM</i> “Proyecto HyTunnel-CS” Mr. Jesús Sancho Cebrián <i>IDOM</i> “E-Tunel. o Smart-Tunel. Una adaptación a las nuevas realidades” Mr. Manuel Alberto Abella Suárez <i>SEOPRIN SL</i> “Next Generation Air Purification System for Road Tunnel with Significant Increased EV Composition” Mr. Chi Kit Ma <i>AECOM Asia Company Limited</i>	15,20 - 15,40	Lecture: “Pedestrian behavior during real scale evacuation experiments in road tunnels” Ms. Natalia Schmidt-Polonczyk <i>XAGH University of Science and Technology</i>
		15,40 - 16,00	Discussion
		16,00 - 18,30	Open communications on the topic “Improved incident management through a resilient organisation” Mr. André Stein <i>Ministère de la Mobilité et des Travaux publics</i> “Coordinación de actuaciones sanitarias en túneles internacionales de gran longitud. El caso del túnel de Somport” Mr. Diego Lagunas Pardos <i>061 ARAGÓN</i> “Estudio sobre la explotación de túneles y la gestión de riesgos. Caso práctico de túneles largos europeos” Mr. Óscar Borobia Cuesta <i>IDOM Consulting, Engineering, Architecture, S.A.U.</i> “Emergencias en túneles con implicación de vehículos de energía alternativa (VEA)” Ms. Nuria Romeo Girón <i>Túnel de Somport</i> “A study of tunnel ventilation control and water spray activation in case of fire” Mr. Musashi Akaishi <i>East Nippon Expressway Company Limited</i> “Using existing Radar infrastructure for tunnel safety management and emergency response” Mr. Seb Baucutt <i>Navtech Radar</i>
14,00	Working lunch		
15,00 - 18,30	FIFTH SESSION: “Operation and sustainable management of tunnels” (Continuation) (Split into two rooms) • ROOM 1: “Emergency management” Chairmanship: Chairman: Mr. Francisco José Ruiz Boada <i>Subdirector General de Prevención, Planificación, Operaciones y Emergencias. Ministerio del Interior</i> Co-Chairman: Mr. Arnold Dix <i>ITA Presidential Nominee</i>		



“Gestion de emergencias mediante planes dinámicos”

Mr. Miguel Ángel Meléndez Fernández
Kapsch TrafficCom Transportation S.A.U.

• ROOM 2: “Risks Analysis”

Chairmanship:

Mr. Bernhard Kohl

Miembro del Comité TC 4.4 “Túneles” de PIARC

Chairman:

Co-Chairman:

Ms. Mónica López Alonso

Directora de la Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos. Universidad de Granada

15,00 - 15,20

Lecture: “Propuesta de actualización de la Metodología de Análisis de Riesgo en Túneles de la Red de Carreteras del Estado de España (MARTE)”

Mr. Guillermo Llopis Serrano
Ministerio de Transportes, Movilidad y Agenda Urbana

15,20 - 15,40

Lecture: “Le modèle d’évaluation quantitative des risques liés au transport des marchandises dangereuses et son projet de mise a jour et d’amélioration”

Mr. Christophe Willmann
Centre d’Etudes des Tunnels

15,40 - 16,00

Discussion

16,00 - 18,30

Open communications on the topic

“Bancabilidad” de un túnel; y cómo los riesgos no mitigados encarecen un proyecto”

Ms. Mercedes Martín Martínez Almeida
Autónomo

“Análisis de riesgo de los túneles urbanos de la Plaza de Las Glorias en Barcelona”

Mr. Iván Perea Méndez
ESTEYCO S.A.

“Euram 3.0: 15 years of risk analysis application in road tunnels”

Mr. Alessandro Focaracci
Prometeoengineering.it S.r.l.

“Smoke control in naturally ventilated tunnels”

Mr. António Galhardo
National Laboratory for Civil Engineering

“Quantitative Risk Analysis: Tool to optimize the design and ensure tunnel safety during the Project Phase”

Ms. Cristina Medina Aparicio
SENER

“Autopista Bogotá a Villavicencio en Colombia. Un ejemplo de integración a nivel mundial”

Mr. Jairo Charry Gómez / Mr. Enrique Segura Echániz
Coviandina / Concesionaria Vial Andina

“Herramienta de análisis combinado de evacuación y humos para túneles de carretera”

Mr. Carlos del Álamo Merino
TYPSA

“An analysis of the influence of tunnel length and road type on road accident variables”

Ms. Antonella Pireddu
Istituto Nazionale per l’Assicurazione contro gli Infortuni sul Lavoro INAIL-Ricerca

“Fréjus Tunnel: French and Italian complementary methods for tunnel risk assessment”

Ms. Federica Luciani
BG Ingegneri Consulenti

“A risk-based approach for design, operation and maintenance of road tunnels”

Mr. Soren Randrup-Thomsen
Rambol Denmark

Thursday, October 27

08,30 - 11,30

SIXTH SESSION:

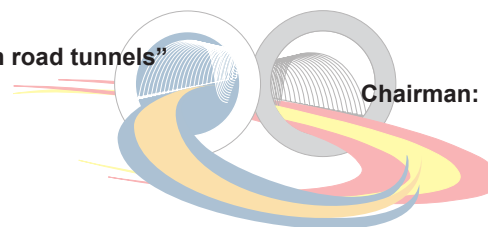
**“Ventilation and lighting”
(Split into two rooms)**

• ROOM 1: “Ventilation”

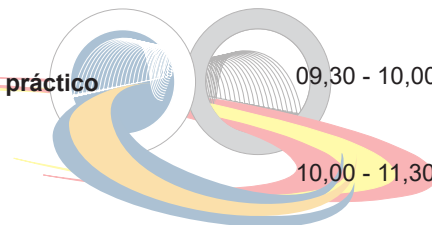
Chairmanship:

Mr. Bijan Khaleghi

Miembro del Comité TC 4.4 “Túneles” de PIARC



Co-Chairman:	Mr. Juan Manuel Medina Torres <i>Decano de la Demarcación del Colegio de Ingenieros de Caminos, Canales y Puertos en Andalucía</i>
08,30 - 08,50	Lecture: “Sustainability in Tunnel Ventilation – Review and Future Prospects” Mr. Fathi Tarada <i>Mosen Ltd</i>
08,50 - 09,10	Lecture: “Innovative ventilation related risk reduction measures for road tunnels” Mr. Salvatore Giua / Mr. Luca Stantero <i>SWS Engineering SPA</i>
09,10 - 09,30	Discussion
09,30 - 11,30	Open communications on the topic
	“Renovación ventiladores túnel 2 Guadarrama de AP-6 año 2020” Mr. Gonzalo Grande Tomé <i>AUTOPISTAS AN ABERTIS COMPANYY</i>
	“La medida de NO2 en túneles. La experiencia en los túneles de Calle 30 (Madrid)” Ms. María del Carmen Bonilla González <i>Calle 30</i>
	“A ventilation operation optimisation study: comparing ventilation analysis to learning algorithm” Mr. Cristian Biotto Aurecon
	“Commissioning tests in heavily trafficked city tunnels under operation” Mr. Johannes Rodler <i>FVTmbH</i>
	“Ventilation control system design of a Montréal road tunnel” Ms. Emmanuelle Debourdeaux <i>Hatch</i>
	“Aplicaciones de inteligencia artificial en túneles. Caso práctico de ventilación” Mr. Ernesto Sánchez Larios <i>SENER</i>

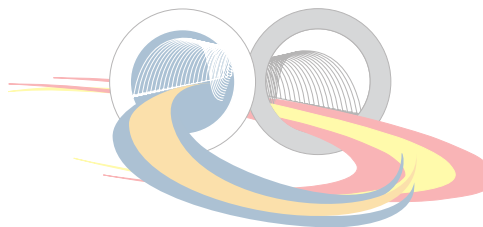


“Improvement of automatic tunnel ventilation control system to remove fog generation at a tunnel entrance” Mr. Morishita Takuya <i>Central Nippon Highway Engineering Nagoya Co., Ltd</i>
“Regulación de ángulo de calaje de alabes en funcionamiento en ventiladores axiales para túneles carreteros de longitud elevada” Mr. Luis Javier Díaz Valdés <i>ZITRON</i>
“Prediction of Pollutant Emission and Concentration Distribution in a Super Long Urban Tunnel in Beijing” Mr. Qiong Li <i>North China Institute of Science and Technology</i>

• **ROOM 2: “Lighting and energy efficiency”**

Chairmanship:	Mr. Salvador Fernández Quesada <i>Ingeniero Jefe de la Demarcación de Carreteras del Estado en Andalucía Oriental</i>
Co-Chairman:	Mr. Jorgen Holst <i>Miembro del Comité TC 4.4 “Túneles” de PIARC</i>
08,30 - 08,50	Lecture: “Regulación de los sistemas de iluminación de túneles de carretera. Estrategias para optimizar su rendimiento” Mr. Javier Borja López <i>IDOM Consulting, Engineering, Architecture, S.A.U.</i>
08,50 - 09,10	Lecture: “Développement d’éclairages LEDs économes en énergie, confortables et sûrs pour l’usager” Mr. Dorian Talon <i>CETU (Centre d’Etudes des Tunnels)</i>
09,10 - 09,30	Lecture: “Plan para la implantación de sistemas inteligentes de gestión de la iluminación en los túneles de Carreteras del Estado” Mr. Luis Azcue Rodríguez <i>Dirección General de Carreteras. Ministerio de Transportes, Movilidad y Agenda Urbana</i>
09,30 - 10,00	Discussion
10,00 - 11,30	Open communications on the topic

	<p>“Sistemas de evaluación dinámica de luminancia e iluminancia en túneles. Caso práctico: Túnel de l’Olleria de la autovía A-7” Mr. Alberto Senén Perales García <i>AMAC EUROPA S.L.</i></p> <p>“Iluminación LED adaptativa en un túnel urbano. Funcionamiento y primeras conclusiones de explotación. Túnel de la Vila Olímpica” Mr. Roberto Martínez García / D. Xavier Travería <i>Àrea Metropolitana de Barcelona / CARANDINI</i></p> <p>“Hidráulica de bombeo no convencional en circuito cerrado como sistema sostenible de almacenamiento de energía en túneles de montaña” Mr. Justo Suárez Fernández <i>INGENIERIC</i></p> <p>“Sacyr Iohnic, una solución innovadora para la iluminación de túneles que mejora la seguridad y reduce el consumo de energía” Mr. Rubén Jover Sevilla <i>Sacyr Concesiones, S.L.</i></p> <p>“Towards more sustainable road tunnels in Australia and New Zealand: Recommendations for practitioners” Ms. Georgia O’Connor <i>Australian Road Research Board (ARRB)</i></p> <p>“Proyecto de implantación de energías renovables y eficiencia energética en el túnel de Carrovide (Navarra)” Mr. Lulen Iturrizaga López <i>MEIK Ingeniería y Consultoría</i></p>	<p>12,00 - 12,20</p> <p>12,20 - 12,40</p> <p>12,40 - 13,00</p> <p>13,00 - 13,15</p> <p>13,15 - 14,15</p>	<p>Lecture: “Diseño de los cuartos técnicos del túnel” Ms. Eva M^a Montero Yéboles <i>TYPSA</i></p> <p>Lecture: “Adaptación a la Directiva Europea 2004/54 de los Túneles de Belate y Almandoz” Mr. Benjamín Celada Tamames <i>GEOCONTROL, S.A.</i></p> <p>Lecture: “The upgrade of the Huguenot Tunnel North Bore and the temporary repairs of the South Bore Tunnel to increase resilience and safety” Mr. Tiago Massingue <i>South African National Roads Agency (SOC) Limited</i></p> <p>Discussion</p> <p>Open communications on the topic</p> <p>“Equipo de Seguridad: Consideración conjunta en un túnel: Fase Preliminar-El Diseño-La Construcción-La Explotación” Mr. Manuel Alberto Abella Suárez <i>SEOPRIN, S.L.</i></p> <p>“13 años de infructuoso esfuerzo por mejorar la seguridad en túneles de elevada peligrosidad” Mr. Mikel Uriarte Toledo <i>Bombero (Gobierno de Navarra)</i></p> <p>“Adecuación de los sistemas de control de túneles en Colombia a la normativa europea. Ejemplos en las concesiones Pacífico 1, Pacífico 2 y Pacífico 3” Mr. Antonio O. Martín Crisenti <i>COMSA INDUSTRIAL S.A.U.</i></p> <p>“Incidentes y accidentes significativos en túneles de carretera. El caso del túnel de Somport” Mr. Íñigo Pérez Martínez <i>Prointec</i></p> <p>“Optimización de la composición de las instalaciones de túneles de carretera para minimizar los costos operativos según el modelo ontológico” Mr. Vladimír Faltus <i>Czech Technical University in Prague</i></p>
11,30 - 12,00	Coffee break		
12,00 - 14,15	<p>SEVENTH SESSION: “Current situation of tunnels in relation to Standards”</p> <p>Chairmanship: Dña. M^a Rosario Cornejo Arribas <i>Presidenta de la Asociación Técnica de Carreteras</i></p> <p>Co-Chairman: D. Miguel Caso Flórez <i>Director Técnico</i> <i>Secretaría General de PIARC</i></p>		



14,15 - 15,00 CLOSING SESSION

Chaired by: Authorities

Intervention by Mr. Arnold Dix
ITA Presidential Nominee

Conclusions from the 2nd Conference
Mr. Rafael Sánchez Tostón
Secretary of the Tunnels Committee. ATC

Closure

15,00 - 16,30 **Closure Cocktail**

COMMUNICATIONS that are not exhibited but that are included in the Book of the Conference/Symposium and of which a video can be recorded for diffusion in the Stands:

TOPIC: "Resilience in road tunnels"

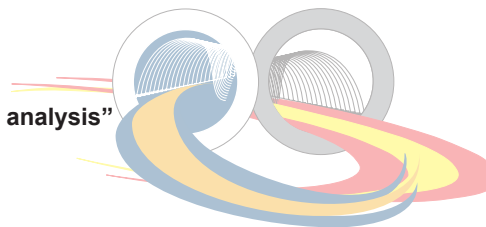
"Plan de Mantenimiento de los túneles"
Mr. José Antonio Morena Villanueva
Calle 30

"Migración de los sistemas de control de túneles en explotación a SCADAS abiertos. Beira Interior, un caso de éxito después de un año de experiencia"
Mr. Antonio O. Martin Crisenti
COMSA INDUSTRIAL S.A.U.

"Resilience assessment tool for road tunnels"
Mr. Kalliopi Anastassiadou
Federal Highway Research Institute (BAST)

"Fixed fire fighting systems in road tunnels: experimental data and cfd fire simulation for water mist systems"
Mr. Walter Mario Lanciano
LP Engineering Srl

"Improving road tunnel resilience by dynamic risk analysis"
Mr. Alessandro Focaracci
Prometeoengineering.it.Srl



"Electric Service Continuity in Road Tunnels"

Mr. Giuseppe Parise
SAPIENZA UNIVERSITY OF ROME

"Resilient Tunnels to Climate Change Through Flood Gates"

Mr. Bijan Khaleghi
Saint Martin's University

TOPIC: "ITS systems and their contribution to improved operations"

"El túnel de la Ferropista en la Cordillera Central de los Andes. Colombia"

Mr. José Pedro Alba García
ARCS Estudios y Servicios Técnicos S.L.

"Proyecto innovación: carretera conectada / CRoads"

Mr. Sergio Barral García
Calle 30

"Gestión de la explotación, durante la renovación del centro de los túneles de la M30"

Ms. Raquel Bartolomé Alcalde
EMESA

"Usos de sistemas de código abierto en el desarrollo de Software de Gestión y Control en Sistemas ITS para Túnel. Descripción del caso de uso de FIWARE"

Mr. Carlos Reifarth
Sistem

"Leading-edge AI technology to improve tunnel's operations"

Mr. Enmanuel Léger
CEO de Cyclope.ai

TOPIC: "Management of urban and high traffic road tunnels"

"Plataforma para la explotación y comunicación en tiempo real con automática"

Ms. Lucía Ruiz Rivero
EMESA

"Diseño de instalaciones en túneles de carretera con análisis de coste de ciclo de vida"

Mr. Juan Carlos Fernández Cuenca
Técnica y Proyectos, S.A. (TYPESA)

“Road safety inspection with special aspects of tunnels”

Mr. Emir Smailovic
Faculty of Transport and Traffic Engineering

“Tunnel Horelica, a bidirectional tunnel with the highest level of traffic in Slovakia”

Mr. Peter Danišovic
University of Žilina

“Comprehensive Countermeasures for the Improvement of Traffic Safety in Tunnel Areas”

Mr. Lee Seungjun
Representante Corea del Sur

“The Effect of the Pilot Project with Comprehensive Countermeasures for Traffic Safety in Tunnel”

Mr. Lee Seungjun
Representante Corea del Sur

“Krabi Bypass, The First Modern Highway Tunnel Project in Thailand: Challenge and Solution”

Mr. Sukit Yindeesuk
Department of Highways

“Designing for maintenance and operation of road tunnels”

Mr. Paul Marsh
WSP

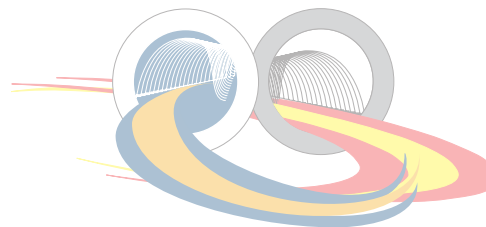
“Gestión y coordinación de centros de control de túneles urbanos: túneles de Barcelona y del Principado de Andorra”

Mr. Ladislao Torija Tamayo
Director de Explotación del “Centre Nacional del Trànsit” (CENATRA)

“Exploring Differences among the Drivers’ Knowledge, Habits and Behavioral Intentions for Urban and Freeway Tunnels”

Mr. Amjad Pervez
Central South University, Changsha

TOPIC: “New vehicle propulsion energies and their impact on tunnels”



TOPIC: “Emergency management”

“Incendios en túneles: formación del personal operativo”

Mr. José Andrés Vieitez Martín
Applus+TST (Tunnel Safety Testing, S.A.)

“Herramientas de ayuda al explotador para la toma de decisiones en caso de un incidente menor en el transporte de mercancías peligrosas”

Mr. Emilio Leo Ferrando
Subdelegación del Gobierno en Huesca. Unidad de Protección Civil

“Plataforma serious games para la gestión de emergencias y la formación avanzada de operadores de túneles carreteros”

Mr. Fernando Morente Bélmez
Tecnalia Research & Innovation

“Nan’ao Traffic Control Center: and Optimal Solution for an Integration of Traffic Control and Emergency Response Management”

Mr. Yu-Kuang Lin
CECI Engineering Consultants, Inc., Taiwan (R.O.C)

“Road Tunnels Multidisciplinary Activities and Tunnel Safety”

Mr. Irfan Unal
PROYAPI Engineering and Consultancy /Turkey

“Development and Maintenance of Tunnel Life Safety Control Systems”

Mr. Burras Simon
Applied Industrial Systems Ltd

“Reduciendo el Tiempo de Cálculo de FDS en Incendios en Túneles Mediante el Desarrollo de un Modelo Multiescala”

Mr. Jesús Alberto Mejias Tuni
Politecnico di Torino

“Understanding Drivers’ Awareness, Habits and Intentions inside Road Tunnels for Effective Safety Policies”

Mr. Amjad Pervez
Central South University, Changsha

“Incidents/Accidents in Motorway Tunnels in Slovenia”

Mr. Drago Dolenc
DARS

TOPIC: “Risk Analysis”

“Cross Tunnels Escape Doors”

Mr. Basil Fuller
Smoke Control Systems

“Impact of the use of cell phones on the road safety of the Oriente Tunnel. Technical report”

Mr. Ricardo Agustín Smith Quintero
ILF Group Holding

“Safety of repair work on the collapsed tunnel of Jebel El Ouahch-Constantine”

Mr. Said Sitayeb
COSIDER

“Road safety inspection with special aspects of tunnels”

Mr. Emir Smailovic
Faculty of Transport and Traffic Engineering

TOPIC: “Ventilation and Lighting”

“Commissioning of the ventilation system in a tunnel under operation”

Mr. Johannes Rodler
FVTmbH

“Impacto de las concentraciones de NOx en el diseño de sistemas de ventilación”

Mr. Isaac Gujjarro Meléndez
AECOM INOCSA

“Control and improvement of these systems”

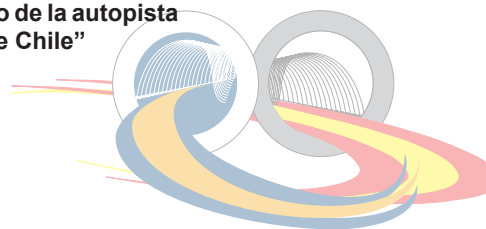
Mr. David Zamora Martínez
Independiente

“Ventilación de túneles con gran longitud y pendiente”

Mr. Juan Manuel Sanz Sacristán
SENER

“Ventilación de un túnel vial urbano de 9 km. El caso de la autopista expresa Américo Vespucio Oriente, en Santiago de Chile”

Mr. Manuel de Cabo Ripoll
Subterra Ingeniería S.L



“Filtración del aire en el Tunnel Central-Wan Chai Bypass, Hong Kong, Experiencia tras tres años en funcionamiento”

Mr. Elke Deux
FILTRONtec GmbH

“FSE approach applied to tunnel ventilation strategies analysis”

Mr. Nicolo Faggioni
DBA PRO S.p.A.

“Fire and life safety engineering performance-based approach for tunnel ventilation system design - case: Malo road tunnel – Italy”

Mr. Walter Mario Lanciano
LP Engineering Srl

“Methodology of selecting a road tunnel ventilation system in Polish conditions using VentSim software”

Ms. Klaudia Zwolinska
Faculty of Civil Engineering and Resource Management, AGH University of Science and Technology

“Enhancements of Tunnel Ventilation System using Semi-Transverse Strategy in Road Tunnels”

Mr. Lung Leo Chang
AECOM

“The compound ventilation system in the tunnels of improved SU-HWA expressway”

Mr. Cheng-chieh Liao
SINOTECH ENGINEERING CONSULTANTS, LTD.

“Algorithms and control logics for tunnel ventilation systems”

Mr. Nicolo Faggioni
DBA PRO S.p.A.

“Performance Verification of Fire Detection and Compound Point Smoke Extraction System in Guanyin Tunnel of Suhua Highway, TAIWAN”

Mr. Chi-Ji Lin
CECI Engineering Consultants, Inc., Taiwan

“A control method to suppress the deterioration of the visual environment caused by fog in road tunnels”

Mr. Yoshiki Akaza
Nippon Expressway Research Institute Company Limited

“Long Greenfield Road Tunnel Ventilation: Longitudinal System for Optimal Design by Batteries of Jet Fans”

Mr. Sunit Kanti Dhar
Individual

“Traffic and wind induced flows – towards improved initial conditions for simulations of road tunnel ventilation”

Mr. Wojciech Wegrzynski
Instytut Techniki Budowlanej

“On the use of factor analysis methodologies with multi-scale models for the evaluation of ventilation systems”

Mr. Alexis Cantizano
Universidad Pontificia Comillas

“Influence of fire source energy density on outcomes of scale modelling of a fire in a sloped tunnel”

Mr. Wojciech Wegrzynski
Instytut Techniki Budowlanej

“Design and applications of road tunnels ventilation algorithms”

Mr. Alessandro Focaracci
Prometeoengineering.it S.r.l.

“Stack effect in traffic tunnel fires”

Mr. Milan Šekularac
Faculty of Mechanical Engineering, University of Montenegro

“Discussion on the smoke prevention strategy of high-altitude tunnel and the evacuation channel spacing”

Mr. Zhang Aoyu
China Communication Construction Company

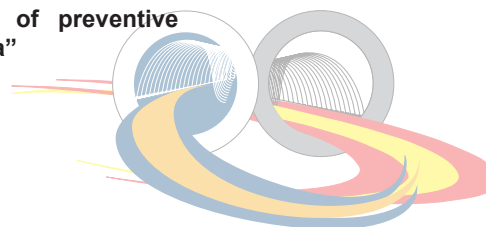
“Renovacion del sistema de ventilacion incluyendo Toberas Saccardo en el Tunel de La Fontaine en Montreal (Canada)”

Ms. Ana Belén Amado García
ZITRÓN

TOPIC: “Adaptation to the regulations”

“Practices and challenges of the application of preventive maintenance principle in the road tunnels in China”

Mr. Ma Jianqin
Chang'an University



“Adaptación a normativa – caso Túnel de La Línea, caso Túnel del Toyo, Colombia”

Mr. Diego Benítez Forero
Integral S.A.

“Utilización de herramientas BIM en proyectos de remodelación de túneles carreteros abiertos al tráfico”

Mr. Íñigo Herráez Puente
IDOM, CONSULTING, ENGINEERING, ARCHITECTURE, SAU

“Improvements on Caracoles and Cristo Redentor tunnels at Los Libertadores International Pass”

Mr. Matias Egana
Representante de Chile

“Gestión de la Seguridad en la rehabilitación de los túneles”

Ms. Milagritos del Pilar Ramírez Vilchez
Consultora independiente. Perú

Friday, October 28

Technical Visit (Detailed plans are attached)

There are two alternatives to decide at the time of registration:

- **Option 1: Tunnels Calle 30 (Madrid)**
- **Option 2: Tunnels Andalucía Oriental**

GRANADA 2022



DESCRIPTION OF THE VISIT

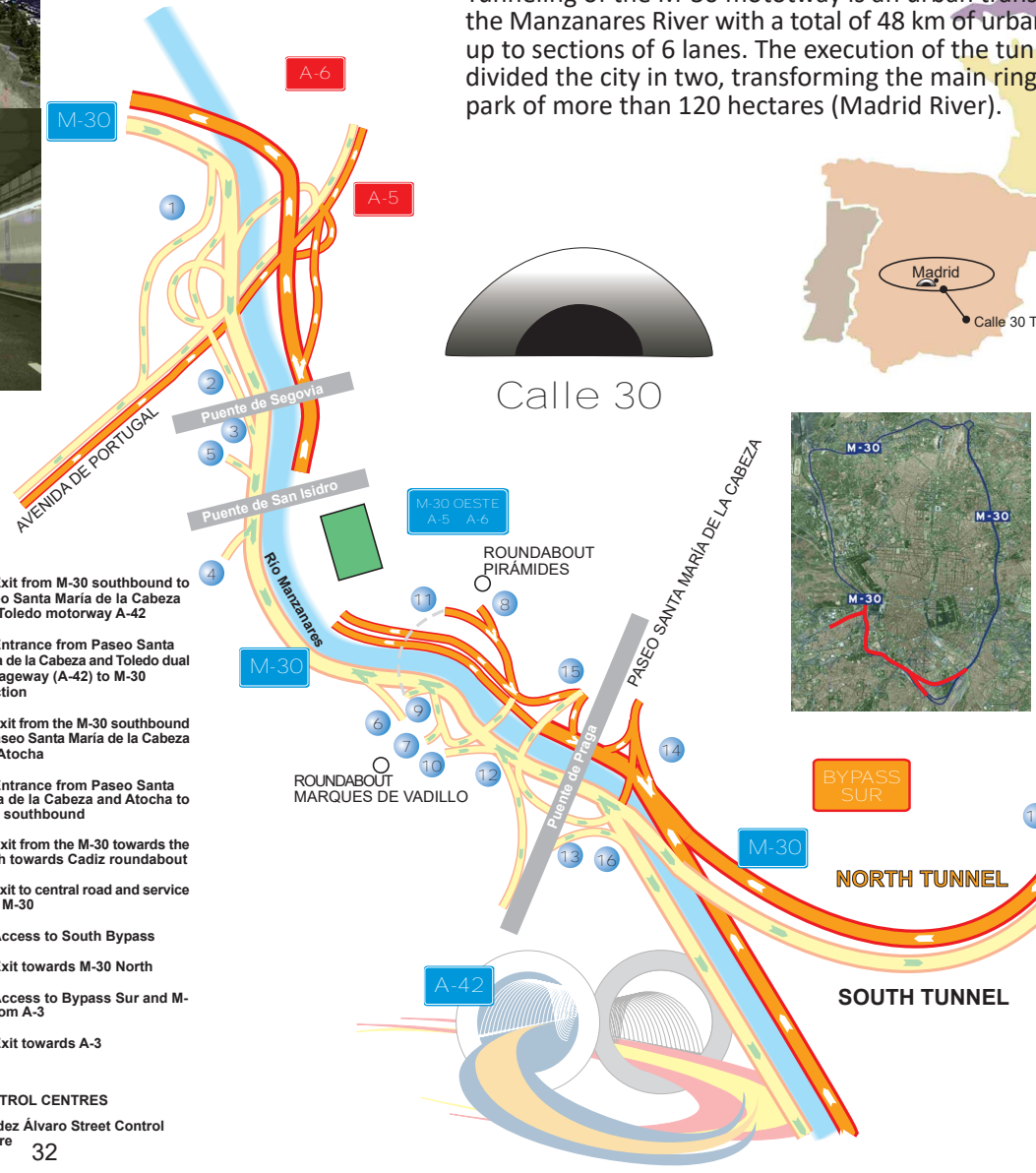
Tunneling of the M-30 mototway is an urban transformation project along the banks of the Manzanares River with a total of 48 km of urban tunnel with various widths, extending up to sections of 6 lanes. The execution of the tunnel to eliminate the great barrier that divided the city in two, transforming the main ring road of the city of Madrid into a large park of more than 120 hectares (Madrid River).



- LINKS CALLE 30**
- 1: Connection of the entrance and exit tunnels of Avenida de Portugal with the M-30 Southbound
 - 2: Exit from M-30 southbound to Segovia bridge
 - 3: Entrance from Paseo La Ermita del Santo to M-30 Southbound
 - 4: Exit from M-30 southbound to Iván de Vargas crossroads
 - 5: Entrance from Calle San Ambrosio to M-30 southbound
 - 6: Exit from the M-30 heading south to the Marqués de Vadillo roundabout
 - 7: Entrance from Marqués de Vadillo roundabout to M-30 Southbound
 - 8: Exit from M-30 Southbound to the Pirámides roundabout
 - 9: Entrance from Pirámides roundabout to M-30 Southbound
 - 10: Entrance from Marqués de Vadillo roundabout to Bypass Sur
 - 11: Connection M-30 South to M-30 South

- 12: Exit from M-30 southbound to Paseo Santa María de la Cabeza and Toledo motorway A-42
- 13: Entrance from Paseo Santa María de la Cabeza and Toledo dual carriageway (A-42) to M-30 direction
- 14: Exit from the M-30 southbound to Paseo Santa María de la Cabeza and Atocha
- 15: Entrance from Paseo Santa María de la Cabeza and Atocha to M-30 southbound
- 16: Exit from the M-30 towards the south towards Cadiz roundabout
- 17: Exit to central road and service road M-30
- 18: Access to South Bypass
- 19: Exit towards M-30 North
- 20: Access to Bypass Sur and M-30 from A-3
- 21: Exit towards A-3

CONTROL CENTRES
Méndez Álvaro Street Control Centre



BYPASS SUR

NORTH TUNNEL

SOUTH TUNNEL

CONTROL CENTRE
Méndez Álvaro street

GRANADA 2022

DIRECTION TO MALAGA

- A-7
- 1: Ítrabo Tunnel 2.092 m**
P.K. 316
- 2: Gato Tunnel 270 m**
P.K. 313+800
- 3: Calaceite Tunnel 410 m**
P.K. 312+600
- 4: Cantalobos Tunnel 2.170 m**
P.K. 307+500
- 5: Marchante Tunnel 1.400 m**
P.K. 302+650
- 6: Pino Tunnel 400 m**
P.K. 301
- 7: Cerrosol Tunnel 200 m**
P.K. 300+400
- 8: Capistrano Tunnel 1.000 m**
P.K. 294
- 9: Torrox Tunnel 1.175 m**
P.K. 287
- 10: Tablazo Tunnel 156 m**
P.K. 286
- 11: Lagos Tunnel 450 m**
P.K. 280
- 12: Cerrado de Calderón Tunnel 788 m**
P.K. 245

- 13: San José Tunnel 375 m**
P.K. 242
- 14: Churriana Tunnel 1.256 m**
P.K. 226
MA-20
- 15: Ortega Prados Tunnel 320 m**
P.K. 10+000
A-45
- 16: Casabermeja Tunnels 900 m**
P.K. 227+100
AP-46
- 17: Cerro Negrete Tunnel 180 m**
P.K. 21+175
- 18: Cerro Lechón Tunnel 1.375 m**
P.K. 11+400
- 19: la Zambra Tunnel 400 m**
P.K. 7+350

DIRECTION TO ALMERIA

- A-7
- 20: Carchuna Tunnel 550 m**
P.K. 341
- 21: Fuentecilla Tunnel 610 m**
P.K. 342
- 22: Gualchos Tunnel 339 m**
P.K. 350

- 23: Madroño Tunnel 535 m**
P.K. 356
- 24: Acebuchal Tunnel 550 m**
P.K. 359
MA-20
- 25: La Guapa Tunnel 500 m**
P.K. 362
- 26: Ramoncillos Tunnel 700 m**
P.K. 365
- 27: Aguadulce Tunnel 1.000 m**
P.K. 433

CONTROL CENTERS

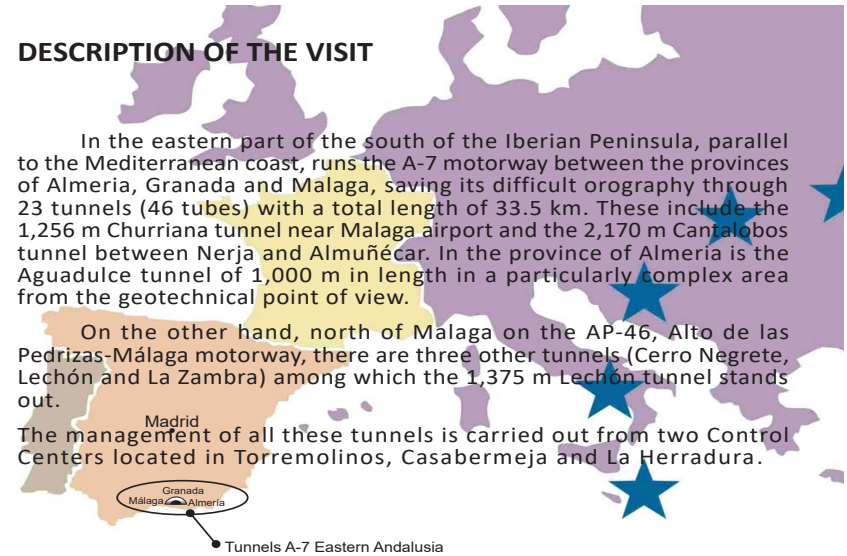
- La Herradura Control Center**
P.K. 305
- Frigiliana Control Center**
P.K. 292 (Frigiliana Road maintenance)
- Churriana Control Center**
P.K. 226
- AP-46 Concessionary Control Center**
P.K. 6 (Casabermeja Toll)
- Aguadulce Control Center**
P.K. 428 (Aguadulce Road maintenance)

DESCRIPTION OF THE VISIT

In the eastern part of the south of the Iberian Peninsula, parallel to the Mediterranean coast, runs the A-7 motorway between the provinces of Almeria, Granada and Malaga, saving its difficult orography through 23 tunnels (46 tubes) with a total length of 33.5 km. These include the 1,256 m Churriana tunnel near Malaga airport and the 2,170 m Cantalobos tunnel between Nerja and Almuñécar. In the province of Almeria is the Aguadulce tunnel of 1,000 m in length in a particularly complex area from the geotechnical point of view.

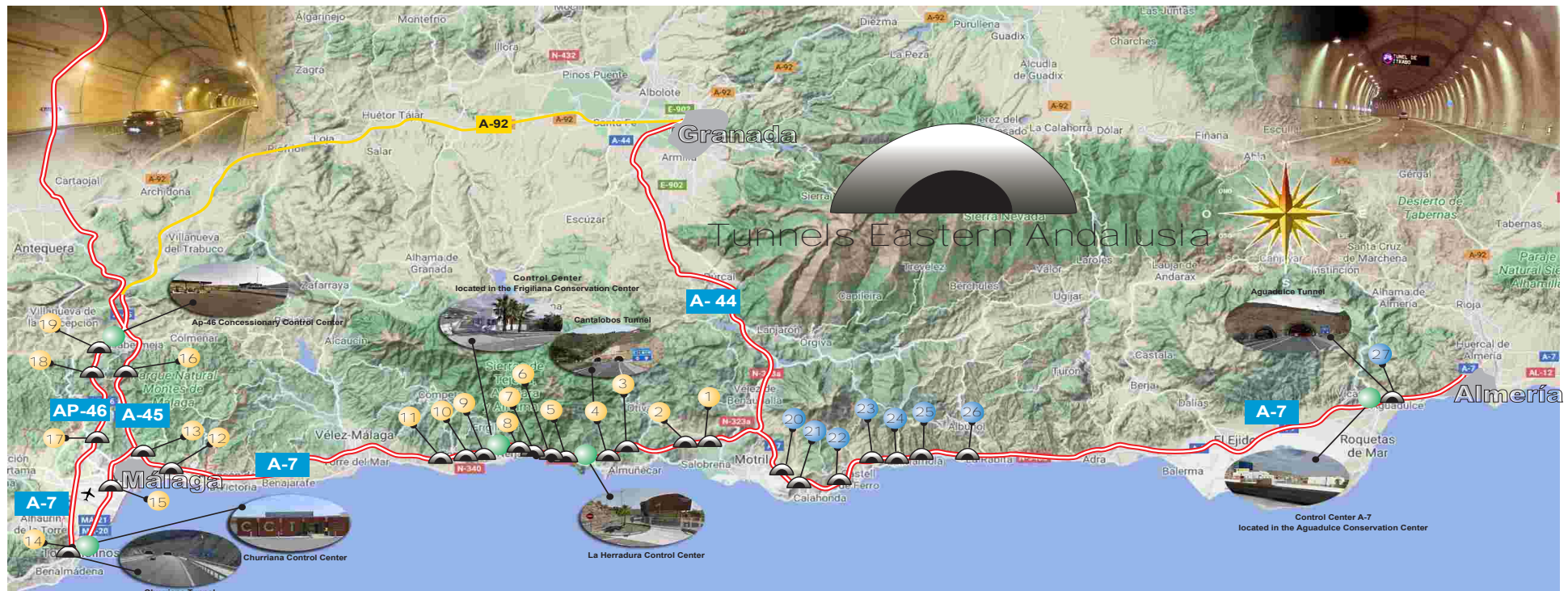
On the other hand, north of Malaga on the AP-46, Alto de las Pedrizas-Málaga motorway, there are three other tunnels (Cerro Negrete, Lechón and La Zambra) among which the 1,375 m Lechón tunnel stands out.

The management of all these tunnels is carried out from two Control Centers located in Torremolinos, Casabermeja and La Herradura.



Granada
Málaga
Almería

Tunnels A-7 Eastern Andalusia



GRANADA 2022

TECHNICAL EXHIBITION

During the four days of the Celebration of the International Conference and the VIII Symposium there will be a Technical and Commercial Exhibition in which the Organisms and Companies will be able to show the novelties in methods, solutions, technologies, or products.

The Organization invites all Organizations and Companies related to the sector to participate in this Exhibition.

Participation in the Exhibition may be effective through modular stands of different dimensions.

Companies and Organizations interested in participating should contact for their request at:

ASOCIACIÓN TÉCNICA DE CARRETERAS

Tel.: +34 91 308 23 18

e-mail: tunnels-spain2022@atc-piarc.com • www.piarc-tunnels-spain2022.org

REGISTRATION FESS

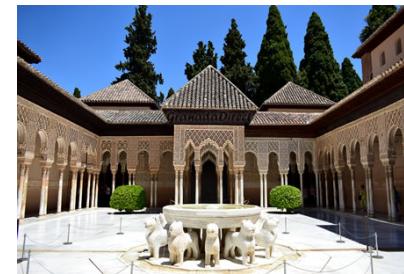
The registration fees for the 2nd International Conference and the VIII Tunnel Symposium, which include attendance at all official events and the book with all the presentations and communications, are:

	Before the 31/07/2022	After the 1/08/2022	Technical Visit (Andalusian Tunnels)	Visita Técnica (Calle 30 Tunnels, Madrid)
General Registration	820 € (VAT included)	920 € (VAT included)	+ 50 € (VAT included)	+ 100 € (VAT included)
Members Piarc Atc Ita Cosuf	680 € (VAT included)	780 € (VAT included)	+ 50 € (VAT included)	+ 100 € (VAT included)
Congressmen presented Communication	600 € (VAT included)	600 € (VAT included)	+ 50 € (VAT included)	+ 100 € (VAT included)
Companions of assistants	200 € (VAT included)	250 € (VAT included)	+ 50 € (VAT included)	+ 100 € (VAT included)

All those interested in attending the 2nd International Conference and the VIII Symposium can register directly through the web www.piarc-tunnels-spain2022.org

ACCOMPANYING PERSONS PROGRAM

It is planned to organize a program of activities for the people accompanying the congressmen. Details of the same will be announced in due course.



GRANADA 2022

ACCOMMODATION

The Organization of the 2nd International Conference and VIII Symposium⁷ proposes the following alternatives of accommodation in Granada during the days of celebration of the event. The Organization does not manage the reservation of accommodation. You can manage your reservation individually and directly according to your stay needs.

Due to the high hotel occupancy in Granada on those dates it is recommended to make reservations in advance. Prices will depend on the availability of rooms on the dates of the event.

The Organization proposes 7 alternatives of accommodation in Granada during the days of the celebration of the event:

- **Hotel SARAY GRANADA 4***

Address: Paseo Profesor Tierno Galván, 4. 18006 - Granada
Tel: +34 958 130 009
reservas.saray@hsantos.es
<https://www.hotelgranadasaray.com/es/>

- **Hotel ANDALUCÍA CENTER 4***

Address: Av. de América, 3, 18006 Granada
Tel: +34 958 18 15 00
<https://www.hotelescenter.es/es/hotel-andalucia-center-granada/>

- **Hotel BARCELÓ GRANADA CONGRESS 4***

Dirección: C. Maestro Montero, 12, 18004 Granada
Tel: +34 958 18 76 00
<https://www.barcelo.com/es-es/barcelo-granada-congress/>

- **Hotel OCCIDENTAL GRANADA 4***

Address: C. Alhamar, 46, 18004 Granada
Tel: +34 958 29 03 03
<https://www.barcelo.com/es-es/occidental-granada/>

- **Hotel BARCELÓ CARMEN GRANADA 4***

Address: C. Acera del Darro, 62, 18006 Granada
Tel: +34 958 25 83 00
<https://www.barcelo.com/es-es/barcelo-carmen-granada/>

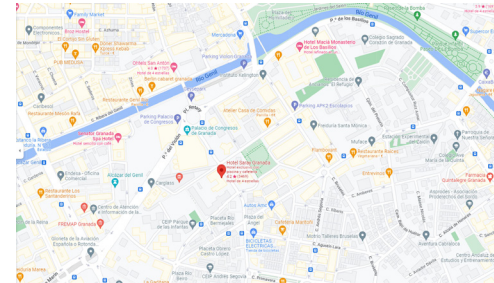
- **Hotel VINCCI ALBAYCÍN 4***

Address: Carrera de la Virgen, 48, 18005 Granada
Tel: +34 958 00 19 20
<https://www.vinccialbayzin.com/>

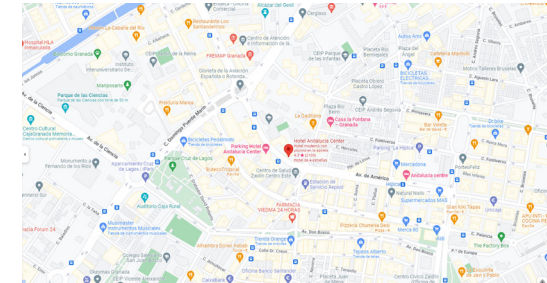
- **Hotel SENATOR GRANADA SPA 4***

Paseo del Violón, s/n. 18006 Granada España
+34 958 131 000 +34 950 333 655
<https://www.senatorgranadaspahotel.com/es> • reservas@senatorhr.com

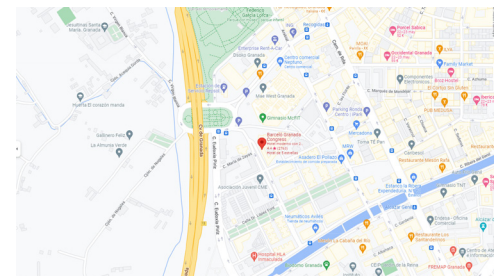
For the reservation, cancellation and other procedures related to the proposed hotels, information and contact are provided below, as well as a sketch of the situation of the hotels.



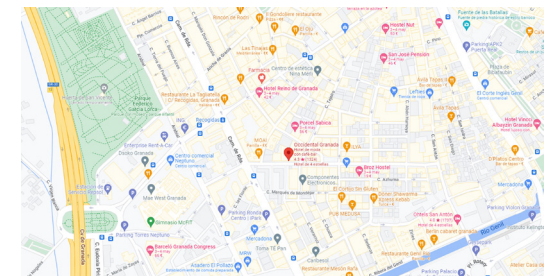
Hotel SARAY GRANADA 4*



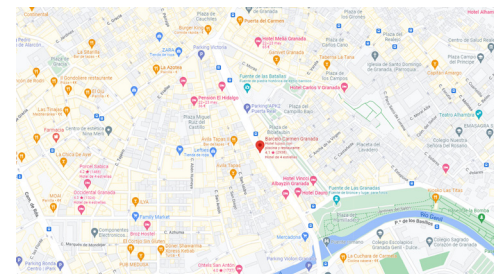
Hotel ANDALUCÍA CENTER 4*



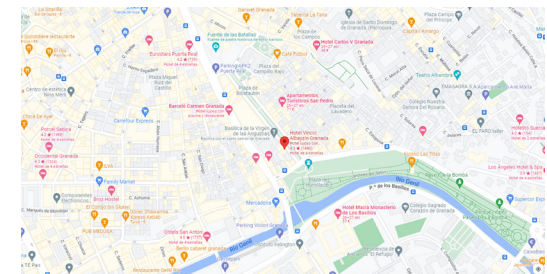
Hotel BARCELÓ GRANADA CONGRESS 4*



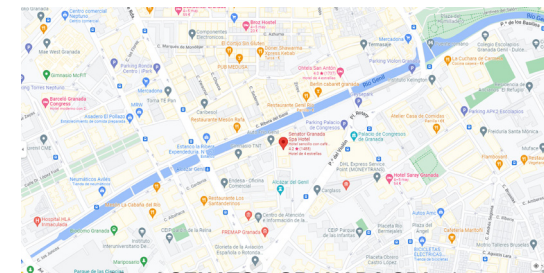
Hotel OCCIDENTAL GRANADA 4*



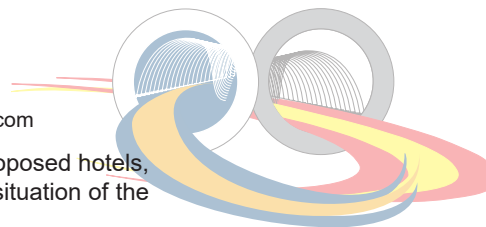
Hotel BARCELÓ CARMEN GRANADA 4*



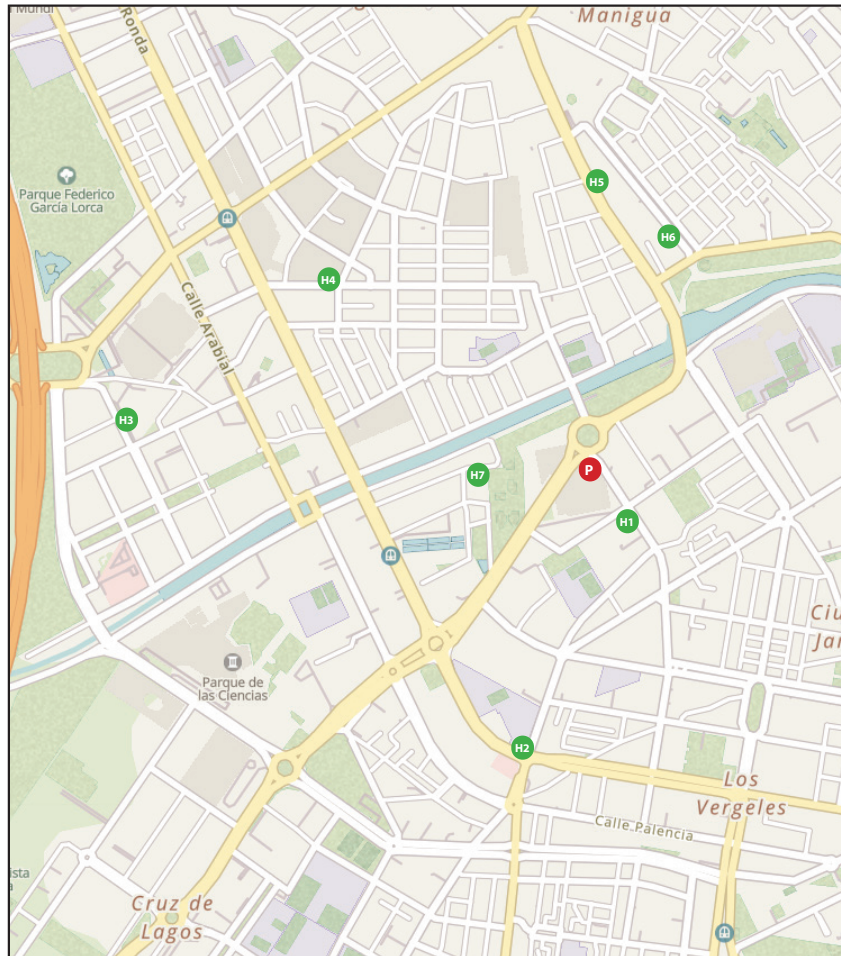
Hotel VINCCI ALBAYCÍN 4*



Hotel SENATOR GRANADA SPA 4*



GRANADA 2022



TÚNELES ATC/PIARC 2022

Localización Hoteles

- P Palacio Congresos (SEDE)
- H1 Hotel Saray Granada
- H2 Hotel Andalucía Center
- H3 Barceló Granada Congress
- H4 Occidental Granada
- H5 Barceló Carmen Granada
- H6 Hotel Vincci Albayzín Granada
- H7 Senator Granada Spa Hotel



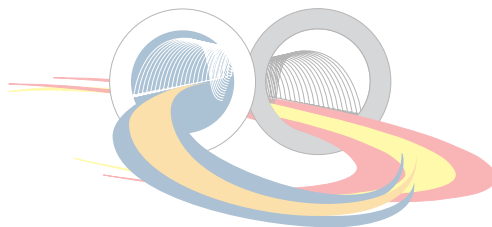
200 m

HOTEL SARAY GRANADA 4* (Hotel SEDE) Bed and Breakfast Buffet.	Double Room for Single Use 119 € Double Room 135 €	Contact: https://www.hotelgranadasaray.com Reservation Code: GRTUNELES Maximun date to make the reservation: Until September 7
HOTEL ANDALUCÍA CENTER 4* Bed and Breakfast Buffet	Double Room for Single Usel 115 € Double Room 130 €	Contact: https://www.hotelescenter.es/hotel-andalucia-center/ Reservation Code: TUNELES (Fill in the reservation form by entering the code in the 4th box)
HOTEL BARCELÓ GRANADA CONGRESS 4* Bed and Breakfast Buffet	Double Room for Single Usel 99 € Double Room 109 €	Contact: https://www.barcelo.com/es-es/barcelo-granada-congress/ Reservation Code: GRTUNELES Link to Access directly: https://bit.ly/3sXQwKu Maximun date to make the reservation: Until August 15
HOTEL OCCIDENTAL GRANADA 4* Bed and Breakfast Buffet	Double Room for Single Usel 88 € Double Room 99 €	Contact: https://www.barcelo.com/es-es/occidental-granada/ Reservation Code: GRTUNELES Link to Access directly: https://bit.ly/3w3AqRc Maximun date to make the reservation: Until August 15
HOTEL BARCELÓ CARMEN GRANADA 4* Bed and Breakfast Buffet	Double Room for Single Use 99 € Double Room 109 €	Contact: https://www.barcelo.com/es-es/barcelo-carmen-granada/ Reservation Code: GRTUNELES Link to Access directly: https://bit.ly/3sZGdfI Maximun date to make the reservation: Until August 15
HOTEL VINCCI ALBAYZÍN 4* Bed and Breakfast Buffet	Double Room for Single Use 149 € Double Room 159 €	Contact: https://www.vincicialbayzin.com/ Making the reservation through the form below, a 10% discount is applied directly on the best rate available at that time https://www.vincicialbayzin.com/?cp=PIARC
HOTEL SENATOR GRANADA 4* Bed and Breakfast Buffet	Rate from October 23 to October 25: Double Room for Single Use 83,90 € Double Room 86,90 € Rate from October 25 to October 28: Double Room for Single Usel 103,40 € Double Room 108,90 €	Contact: https://www.senatorgranadaspahotel.com/es-reservas@senatorhr.com/ Reservation management by phone to the Groups department(+34 950 335 335) or by email: grupos@playasenator.es When making the reservation, indicate the "EVENTO PIARC 2" REF: R2XD

- Taxes included
- Payment and cancellation policy established at the hotel
- Subject to availability at the time of booking

GRANADA 2022

SITUATION PLAN





www.piarc-tunnels-spain2022.org