Colaboración con Australia: Ferrovial-RMIT
what is ferrovial?

Since its foundation in 1952, Ferrovial has become one of the leading infrastructure and services operators, committed to developing innovative and sustainable solutions.

Included in the Ibex 35, and in the Dow Jones, FTSE4Good, PRIME and CDP Sustainability indexes.

Revenue: € 10,759 M
Backlog: € 33,519 M
EBIDTA: € 944 M
Net Income: € 376 M
Net cash position: € 697 M
Employees: 96,001 in 25 countries
Ferrovial, two main assets: Highway 407 ETR and Heathrow Airport, both now consolidated by equity method, set new traffic records and distributed dividends.

**Heathrow**

Making every journey better

**407 ETR**

Express Toll Roads

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**HAH (25%)**

<table>
<thead>
<tr>
<th>HAH 2016 Revenues</th>
<th>GBP 2,809 Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAH 2016 EBITDA</td>
<td>GBP 1,683 Million</td>
</tr>
</tbody>
</table>

**407 ETR (43%)**

<table>
<thead>
<tr>
<th>407 ETR 2016 Revenues</th>
<th>CAD 1,135 Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>407 ETR 2016 EBITDA</td>
<td>CAD 985 Million</td>
</tr>
</tbody>
</table>

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Revenues 2016:

- **€ 10,759 million**

EBITDA 2016:

- **€ 944 million**

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**Services**

- 56%

**Construction**

- 39%

**Toll Roads**

- 5%

**Geographic distribution**

- 24% Spain
- 30% UK
- 24% ROW
- 31% US & Canada
- 9% Australia & NZ
- 15% Poland
- 13% ROW
- 4% UK
- 9% Australia & NZ
- 15% Poland
- 13% ROW
- 4% UK

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**Business divisions**

- 35% Construction
- 34% Services
- 13% Poland
- 9% Australia & NZ
- 11% ROW
- 43% Spain
- 4% UK
business model

Integrated Infrastructure Management (DBFOM)

Infrastruc ture

- Design
- Construction
- Funding
- Operation
- Maintenance

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**ferrovial agroman**

Construction
- Civil engineering
- Building
- Industrial
- Design & Build

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**cintra**

Toll Roads
- Concession
- Operation

---

**ferrovial airports**

Airports
- Ownership
- Operation

---

**ferrovial services**

Services
- Urban services & waste
- Facility management
- Infrastructure maintenance

---

End-to-end Infrastructure Company
**Ferrovial subsidiary that carries out civil engineering, construction and industrial projects.**

- **Revenue 2016:** €4,194 M
- **Backlog 2016:** €9,088 M
- **17% Spain**
- **83% International**

**Budimex**

Poland’s largest construction company. Subsidiary of Ferrovial Agroman since 2000.
- **Revenue in 2016:** €1,270 M
- **Backlog in 2016:** €2,027 M

- www.budimex.com.pl

**Webber**

One of the largest road construction groups in Texas.
- Leader in the production and distribution of recycled construction aggregates.
- Subsidiary of Ferrovial Agroman since 2005.
- **Revenue in 2016:** €708 M
- **Backlog in 2016:** €1,084 M

- www.wwebber.com

**Cadagua**

- Cadagua has designed and built more than 235 water treatment plants and its contracts total approximately 21 million equivalent population.

- www.cadagua.es
construcción

presencia

Area 1

Area 2

Area 3
An Australian Company With +60 Years of Global Experience

Australia | New Zealand | USA | Canada | Chile

05 core countries  +200 clients  25,000 employees
Australia's largest construction companies

Revenue (A$ billion)

<table>
<thead>
<tr>
<th>Company</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferrovial</td>
<td>15.04</td>
</tr>
<tr>
<td>Bouygues</td>
<td>49.60</td>
</tr>
<tr>
<td>ACS</td>
<td>50.26</td>
</tr>
<tr>
<td>CPB</td>
<td>9.51</td>
</tr>
<tr>
<td>Lend Lease</td>
<td>13.28</td>
</tr>
<tr>
<td>Acciona</td>
<td>10.14</td>
</tr>
<tr>
<td>Salini -</td>
<td>7.35</td>
</tr>
<tr>
<td>OHL</td>
<td>6.77</td>
</tr>
</tbody>
</table>

Exchange rate € - A$: 1.55
30.05.2016
Australia’s largest construction companies

Market Capitalization (A$ billion)

- **Ferrovial Group**
  - Market Capitalization: 21.34 billion
- Bouygues
  - Market Capitalization: 14.77 billion
- ACS
  - Market Capitalization: 13.11 billion
- Cimic
  - Market Capitalization: 12.11 billion
- Lend Lease
  - Market Capitalization: 7.82 billion
- Acciona
  - Market Capitalization: 5.97 billion
- Impregilo
  - Market Capitalization: 2.17 billion
- OHL
  - Market Capitalization: 2.00 billion

Exchange rate € - A$: 1.55
30.05.2016
2002
- Ferrovial Agroman bid for the Lane Cove Tunnel
- Ferrovial Airports acquired shares of Sydney Airport Concession (19.60%)

2003
- Ferrovial Airports increased Sydney Airport share holdings (20.68%)

2006
- Ferrovial Airports acquired BAA including shares in Melbourne, Perth, Darwin, Alice Spring Airports

2007
- Ferrovial Airports sold its shares in Australian Airports

2011
- Ferrovial established an Australian Head Office in Sydney

2014
- Amey established an Australian Head Office in Sydney

2016
- Ferrovial Services acquired Broadspectrum

2012
- Cintra established an Australian Head Office in Sydney
Australia & NZ

2011
• Ferrovial established an Australian Head Office in Sydney
• Ferrovial was shortlisted for the Wynyard Walk Project
• Ferrovial was prequalified under the National Prequalification System for Roads and Bridges for R5, B4 and F150+, the highest construction certification in Australia

2012
• Ferrovial obtained AS/NZS 4801 and OHSAS 18001 certifications
• Ferrovial was selected as one of the WestConnex Industry Partner Development Team in NSW

2013
• Ferrovial was accredited under the OHS Accreditation Scheme
• Ferrovial was awarded the Nelson Bay Road Upgrade contract, launching the first construction activities in the country
• Ferrovial was selected as one of the ECI Tenderers for the A$ 550M Warrell Creek to Nambucca Heads Upgrade, Pacific Highway
• Ferrovial was certified against AS/NZS ISO 14001 & AS/NZS ISO 9001

2014
• Ferrovial was prequalified under the National Prequalification System for K2 and A2
• Ferrovial commenced the construction of the Sancrox Traffic Arrangement project, NSW
• Ferrovial was established

2015
• Ferrovial was awarded the A$ 1.6B PPP Toowoomba Second Range Crossing Road in Queensland
• Ferrovial was awarded the A$ 350M Northern Beaches Hospital Road Works in NSW
• Ferrovial successfully completed its first project in Australia, the Nelson Bay Road Upgrade obtaining an Environmental Award from RMS
• Ferrovial completed the construction of Sancrox Traffic Arrangement project, NSW
• Ferrovial achieved the highest
Ferrovial Agroman (Australia)

Growth
Revenue (A$ million)

E: Estimated at 30.05.2016
# Ferrovial Agroman (Australia)

## 2016 Highlights

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>299</td>
</tr>
<tr>
<td>Headcount</td>
<td>1,245</td>
</tr>
<tr>
<td>TTD</td>
<td>2,879,928</td>
</tr>
<tr>
<td>TTD (May 16)</td>
<td>260,589</td>
</tr>
<tr>
<td>FAI Free</td>
<td>260,589</td>
</tr>
<tr>
<td>LTI</td>
<td>1</td>
</tr>
<tr>
<td>LTI Free</td>
<td>260,589</td>
</tr>
<tr>
<td>Managed Revenue</td>
<td>34 m$</td>
</tr>
<tr>
<td>FA Revenue</td>
<td>19 m$</td>
</tr>
<tr>
<td>MTI_m</td>
<td>0</td>
</tr>
<tr>
<td>MTI_y</td>
<td>2</td>
</tr>
<tr>
<td>MTI_TTD</td>
<td>12</td>
</tr>
<tr>
<td>FAI_m</td>
<td>3</td>
</tr>
<tr>
<td>FAI_y</td>
<td>13</td>
</tr>
<tr>
<td>FAI_TTD</td>
<td>53</td>
</tr>
</tbody>
</table>

**28%**
Human Resources

Gender Distribution

- Male: 28%
- Female: 72%

Average Age

- Male: 38
- Female: 35

Client
Roads and Maritime Services NSW
Government

Budget
148 M/€

Completion
2016-2018

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Pacific Highway. Warrell Creek and Nambucca Heads. Australia

Client
Gobierno de Australia y Nueva Gales del Sur

Budget
350 M/aud$

Completion
2014-2016
Design and construction of the road networks for the new hospital of Northern Beaches, Sydney, Australia

Client
Roads and Maritime Services (RMS)

Budget
219 M/€

Completion
2015-2018

Pacific Highway Upgrade - Sancrox Interchange

Client
Roads and maritime services (RMS)

Completion
2014-2027

Budget
25 M/$
RMIT University
A Global University of Technology, Design and Enterprise

Marta Fernandez
Executive Director, RMIT Europe
RMIT University

Over 83,000 students
Over 11,000 staff
38% international students
50,000 undergraduate students
RMIT's Global Reach

Shanghai, China
The Shanghai Academy of Social Sciences and RMIT's Global Cities Research Institute are working together to explore the challenges of urbanisation.

Tianjin, China
The Tianjin Government Leaders Training Program supports the next generation of Tianjin leaders through international training at RMIT.

Xuzhou, China
Researchers are collaborating with the China University of Mining and Technology to improve mine safety and support more efficient mining emergency management and services.

Guangdong, China
China's largest Chinese Medicine hospital is training RMIT researchers to help provide better health outcomes for sufferers of asthma and chronic bronchitis.

Melbourne, Australia
RMIT is a leading research university with a long history of innovation and world-class research. It is a partner in the Victorian Government's Research Hub initiative.

Los Angeles US, Berlin (Germany), Kuala Lumpur (Malaysia), Melbourne (Australia), Papua New Guinea
Research on migrant workers and the impact of climate change is being conducted in these regions.

Plaintfield, United States
As part of the long-running internship program, RMIT aerospace engineering students spend a year working on the US Air Force's 50th anniversary project as part of the GE Rolls-Royce Engine Team.

Blackburn, United States
A $1.2 million, five-year project between RMIT and Virginia Tech is improving the safety of ships, in collaboration with RMIT and Virginia Tech.

Hyderabad, India
Environmental and industrial projects in the area are benefiting from a joint research centre established by RMIT and the Indian Institute of Chemical Technology.

Bangalore, India
Researchers are collaborating with ATR on automation software engineering.

Porto Alegre, Brazil
RMIT's top industrial and furniture design graduates have been chosen to develop new designs for the prestigious Salone Internazionale del Mobile for almost a decade.

Scott Base, Antarctica
A world-first project to reduce the environmental impact of an Antarctic base could be replicated across the continent.

Exeter, Australia
RMIT is collaborating with the University of Exeter to advance sustainable manufacturing of sports shoes and clothing.
RMIT Europe focus

1. Promote research collaboration
2. Enhance student experience
3. Raise profile and reputation
Reputation and rankings

1. Art and Design
2. Architecture and the Built Environment
3. Engineering (Civil and Structural; Electrical and Electronic; and Mechanical)^
4. Accounting and Finance^
5. Business and Management Studies^
6. Global Fashion School Rankings
Enabling Capability Platforms

- Advanced manufacturing and fabrication
- Advanced materials
- Biomedical and health innovation
- Social change
- Global business innovation
- Design and creative practice
- Information and systems (engineering)
- Urban futures
Boeing – Biomimicry

“We see our continued alliance with RMIT as a way to not only conduct meaningful joint research, but more importantly, to find and inspire the next generation of researchers, engineers and scientists for Australia and indeed the world.”

General Manager, Boeing Research and Technology Australia, Michael Edwards

RMIT’s Professor Stuart Bateman and Professor Calum Drummond with BR&T-A General Manager, Michael Edwards, RMIT Vice-Chancellor and President, Martin Bean CBE, and Boeing Aerostructures Australia Managing Director, Mike Dickinson.
Award from Anglo American at the Unearthed Melbourne Hackathon. Makes a miner’s clothing ‘intelligent’, with embedded sensors on all their personal protective equipment which then monitor and inform mine personnel of potential safety hazards, like if they’ve forgotten to use safety glasses.
The project, led by Consolidated Land and Rail Australia Ltd (CLARA), is thought to be the largest undertaking of its kind anywhere in the world. It aims to address overcrowding in Melbourne and Sydney by developing high-tech and sustainable cities in regional Victoria and NSW.
Nuestro objetivo es promover el desarrollo y aumentar la productividad y la competitividad a través de la innovación.

**Líneas estratégicas**
- Infraestructuras inteligentes
- Eficiencia energética - Sostenibilidad
- Tratamiento de aguas
- Medio ambiente
- Tecnologías de la información aplicadas

**Fomento de la innovación**
- Ferrovial Zuritanke awards: 1.427 nuevas ideas presentadas en 2016
- Ferrovial Agroman Innovate awards: 24 actuaciones innovadoras ya realizadas premiadas en la Edición 2016

**Presencia internacional**
- Miembros de los comités directivos de las más importantes organizaciones internacionales de I+D e innovación: ECTP, E2B, Shift2rail, Buildoffsite (UK)...
- Presidencia de ENCORD

**Promover / Identificar / Incentivar / Invertir / Comunicar**

**Conocer / Crear colaboración / Añadir valor / Demostrar / Proteger**
Proactive Community Involvement

e-Plant Management Solution

Excellence in Leadership

Sustainability Management at Nursery Road Basin

Smart Workzone Radar

P47 Dust Suppression

Protection of native fauna (Giant Barred Frog)

Pile Movement Prediction Modelling
Lower Warrell Creek Bridge Construction Methodology

Deck Pour Methodology for Bridges

Environment Sustainability in Drainage Works

BIM-4D and its contribution to forward thinking planning

Digitalized e-Access

Leading the Way - Indigenous Traineeships
Monitorización en tiempo real de los centros de trabajos para digitalizar y automatizar actividades de construcción mediante el análisis inteligente de información obtenida mediante sensores locales y remotos
El proyecto WALLABY facilita la transformación digital del entorno de obra orientandolo al nuevo concepto de Industria 4.0.

En él se plantean tres casos de uso:

- Movimiento de tierras,
- Control de construcción
- y evaluación temprana de accidentes de trabajo.

Convocatoria: programa INNOGLOBAL
Presupuesto: <400.000€
Plazo: 18 meses
Escenario 1. Movimiento de tierras

Optimización del seguimiento y control de los trabajos de movimientos de tierras en obra, mediante el uso de realidad aumentada para la visualización en tiempo real de los trabajos y de la información de la producción.
Escenario 2. Evolución de la obra.

Optimizar el proceso de seguimiento y comprobación del plan de obra, notificando en tiempo real las incidencias o retrasos del proceso constructivo para garantizar la entrega del proyecto dentro del plazo contratado, junto con identificación de los problemas y toma de decisiones temprana de acciones compensatorias.
Escenario 3. Evaluación temprana de accidente en obra.

Mejorar las condiciones de seguridad y salud de los trabajadores en obra, garantizando que en todo momento que el trabajador esté avisado de los riesgos que conlleve la realización de su actividad.
RMIT role Wallaby

Collaboration across 3 schools

1. Assessment of data capture technologies, market and regulations
2. Deployment and validation in a civil work in Australia
3. Comparison of results with traditional methods
Beneficios:
- Establecimiento de relación con Universidades locales.
- Captación de talento.
- Colaboración con entidades y administraciones Australianas.

Barreras técnicas
- Rechazo a la introducción de nuevas tecnologías en obra.
- Rechazo al aprendizaje de nuevos procedimientos.
- Validez de la solución en los dos países bajo dos normativas diferentes.
- Homogeneidad de la solución obras diferentes
- Coordinación de los pilotos en el tiempo.
- Nuevas responsabilidades de puesta en servicio y mantenimiento

Problemas organizativos
- Implementación en Australia de los desarrollos realizados en España.
- Coordinación y comunicación con todos los integrantes del proyecto.
Benefits

1. Applied research with impact
2. Real world challenges that inform research
3. Students ready for life and work
Challenges

1. Distance and timezones
2. Alignment of national funding in Spain & Australia
3. Detailed scope – testing, equipment
Next steps - internships
Next steps – student challenges
Gracias

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