



CLEMSON UNIVERSITY

International Center for Automotive Research



Clemson University International Center for Automotive Research



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The Vision



To be the premier automotive and motorsports research and educational facility in the world.



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The Mission



- **To establish the core facilities for automotive/motorsports research in the world.**
- **To provide world-class graduate automotive engineering programs.**
- **To be the university/industry interface for the associated engineering, management, marketing, and communication disciplines.**



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Potential Research Facilities



- **Automotive electronics systems laboratory**
- **Chassis testing laboratory**
- **Tire and wheel testing laboratory**
- **High performance computing laboratory – modeling and simulation**
- **Acoustic and environmental test facility**
- **Fuel economy and alternative fuels laboratory (especially hydrogen)**
- **Safety/crashworthiness laboratory**
- **Full-scale wind tunnel**



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Graduate Engineering Center



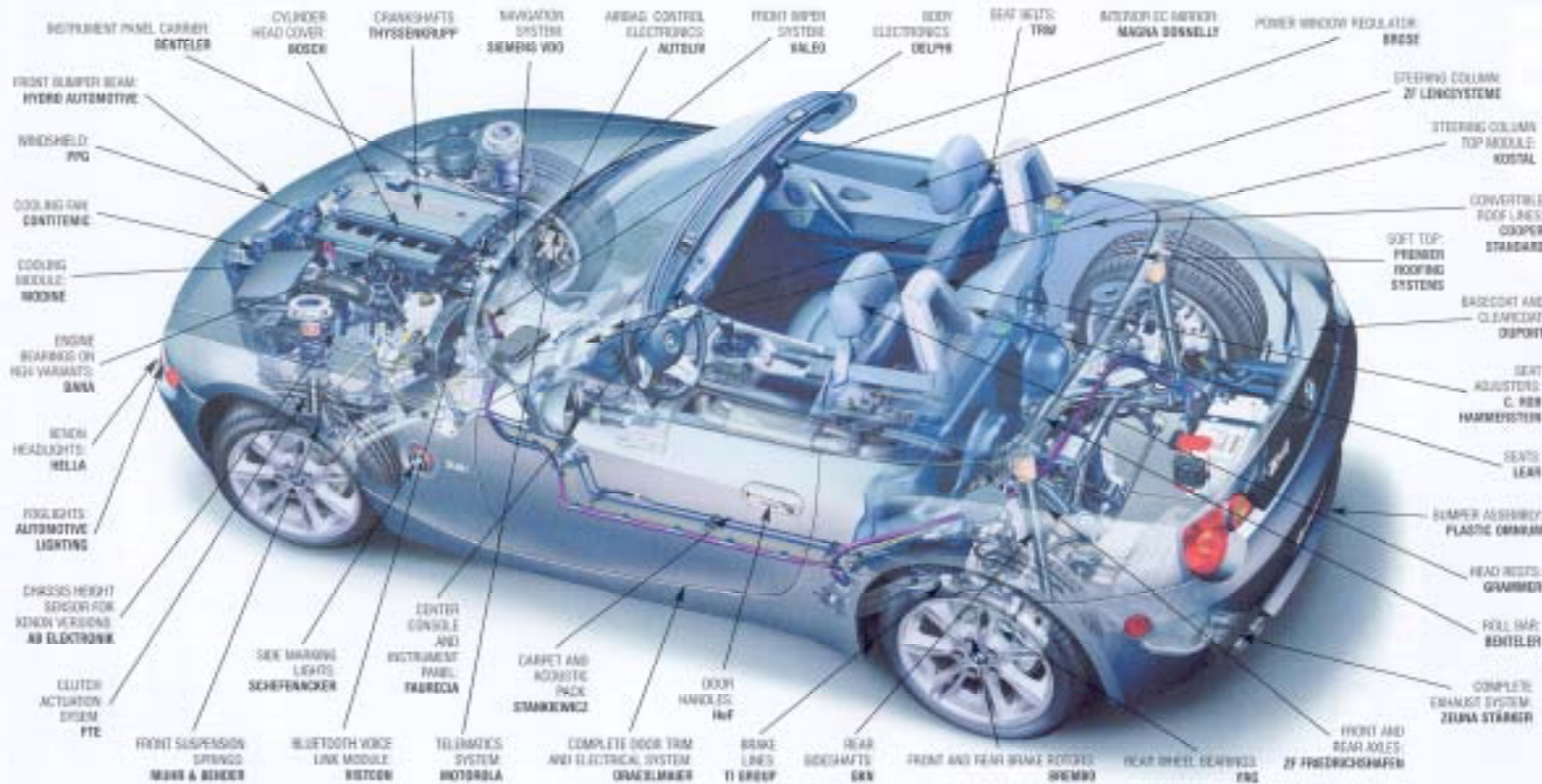
- **World-class workforce is the intellectual capital need of the automotive/motorsports industry**
 - **M.S. and Ph.D. in Automotive Engineering**
 - **System integration**
 - **Underlying principles using the automobile as a platform**

■ Why System Integration?

BMW Z4

Pre-series production of the new Z4 roadster was carried out at BMW's plant in Spartanburg, South Carolina, USA, while assembly of the X5 sport-utility and outgoing Z3 roadster continued. Ramp-up to full production of the Z4 was completed in around three months. Volumes are forecast around 40,000 cars

annually, roughly the same as the Z3. The Z4 is the first BMW to feature electric power steering; ZF Lenksysteme supplies the column and steering gear. Several key suppliers were carried over from the Z3, including Zeuna Stärker (exhaust system), Lear (seats) and PPG Industries (windshield).





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- **Faculty**

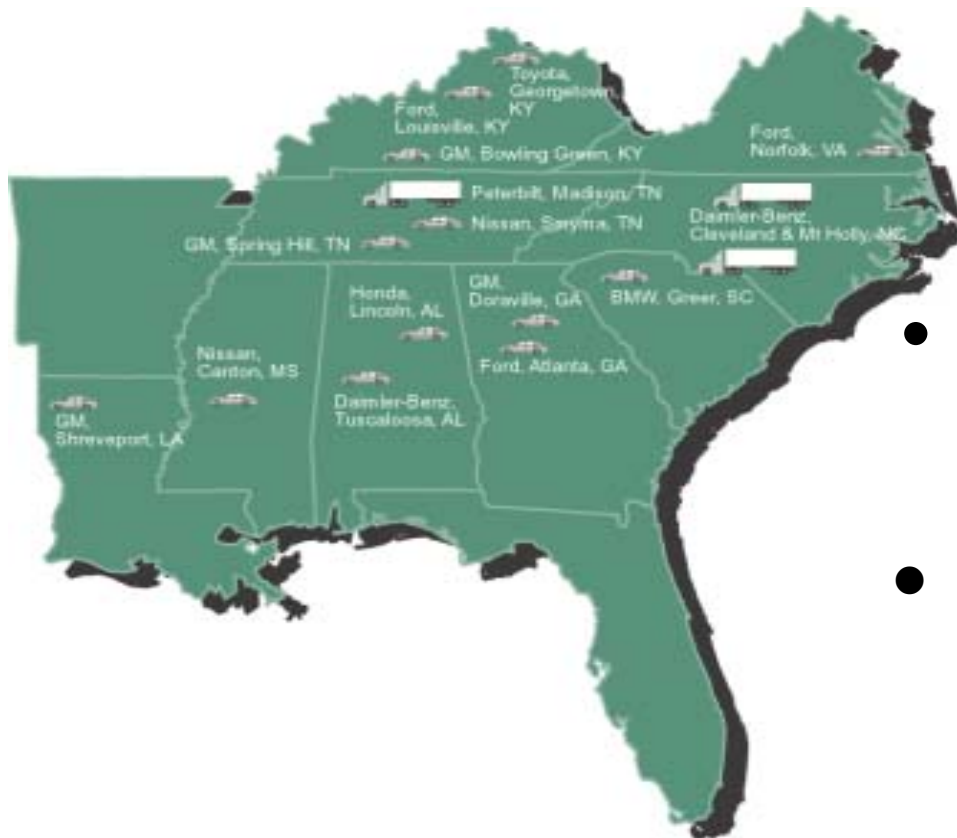
- **Four senior, world-class faculty members in automotive engineering: systems integration, design and development, electronic systems, and manufacturing**
- **Six junior faculty members closely associated with senior faculty members**
- **Visiting faculty members with international reputation**
- **Adjunct faculty from local industries**
- **Complemented by existing, on-campus faculty**



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Why South Carolina?



- **Over 1,000 Automotive Assemblers & Suppliers in 500 mile radius**
- **Greater than the equivalent Detroit area**



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SC Economic Impact



- **Largest economic impact industry in SC - BMW and suppliers' investment over \$4 billion and over 9,000 related employment**
- **Over 200 Automotive Companies in SC**
- **115 First or Second Tier Automotive Suppliers in the State**





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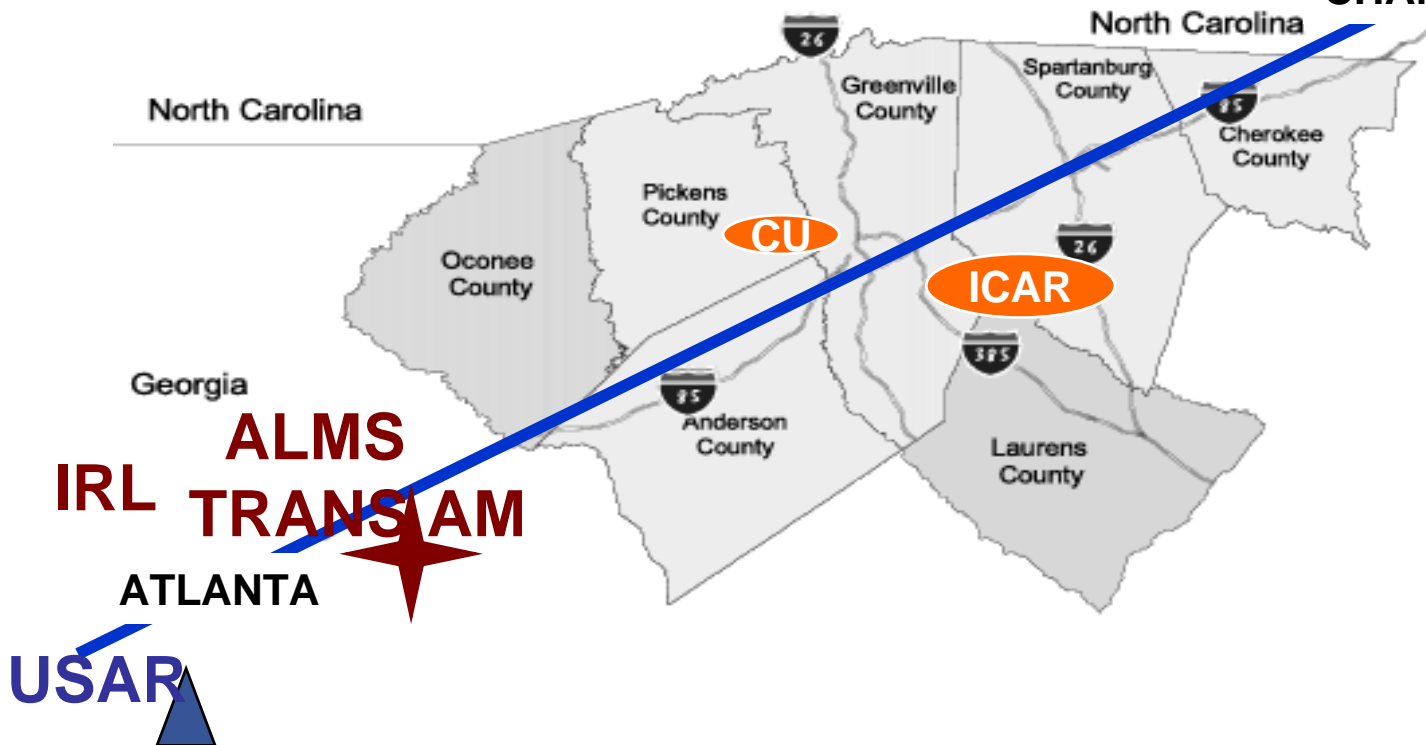
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US Motorsports Corridor



**2/3 of Major US RACING TEAMS
Located Between Charlotte and Atlanta**

NASCAR 
CHARLOTTE





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South Carolina Competitiveness Initiative



Phase I Final Presentation (December 8, 2003)

Automotive Cluster

Vision Element: A center of R&D in the Southeast

Action Agenda:

- **Continue to support Auto Research Park (ICAR)**
- **Develop cluster specific institutions for collaboration**
- **Support engineering training**

**Dr. Michael E. Porter
Professor of Economics
Harvard University**



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Carolinas Competitiveness Forum (April 30, 2004)



. . . focus on a few industries to form a deeper infrastructure

- **Automotive: clear advantage needed against the Midwest/Mississippi Valley**

e.g. ICAR at Clemson University needs to be further developed beyond BMW, Michelin, IBM and MS

Dr. Kenichi Ohmae
Former Director of McKinsey & Co.
Author bestselling book:
The Borderless World



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Automotive OEM



- **BMW**
 - **Mercedes**
 - **Toyota**
 - **Hyundai**
 - **Honda**
 - **Nissan**
 - **Mazda**
 - **Ford**
 - **Chrysler**
 - **General Motors**
- ↓
- **Research Pushed Down**
 - **Tier I, II, & III Suppliers**



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UK Motorsports Industry



UK Motorsports Industry Association

- **Britain's Motorsports Valley - 100 miles around Oxford**
- **38,500 employees (65% engineers)**
- **Gross Industry Annual Revenue \$8 billion - half exported**
- **1,700 companies have interest in getting involved in US motorsports industry**
- **500 companies are previewing US locations (Detroit, Indianapolis, Charlotte and Greenville)**



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How?



A Public/Private Partnership

CLEMSON UNIVERSITY

- Driven by its vision to be among the nation's top 20 public universities.
- Among the most reputable graduate automotive and motorsports engineering programs in the US.

SOUTH CAROLINA DEPARTMENT OF COMMERCE/UPSTATE ALLIANCE

- Economic development through building knowledge-based cluster industries, attracting/retaining traditional manufacturing, and supporting small businesses.

BMW MANUFACTURING CORP., IBM, MICROSOFT, MICHELIN and others

- Companies with a strategic interest in automotive/motorsports research, development, education or light manufacturing.



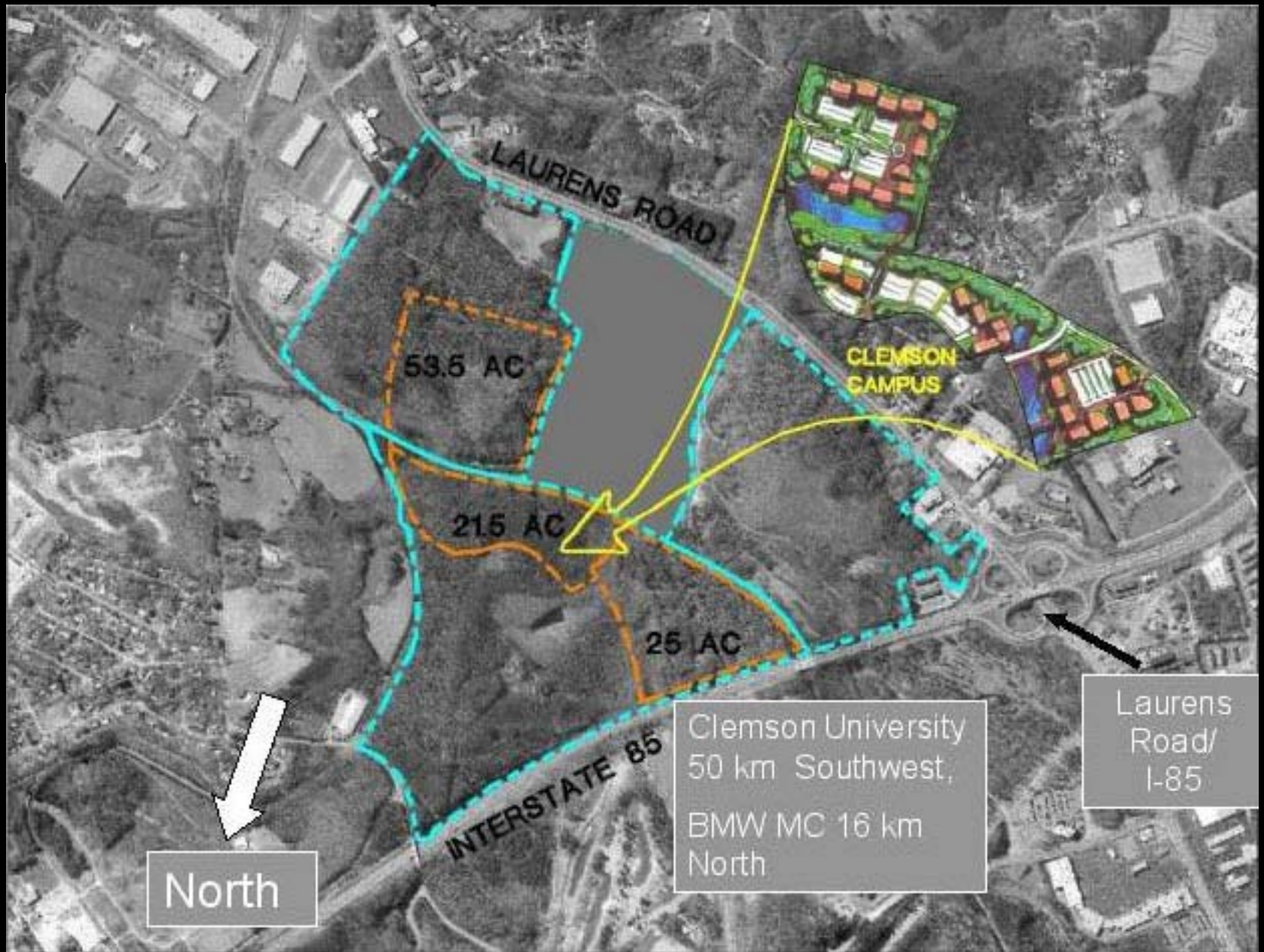
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Investment Summary

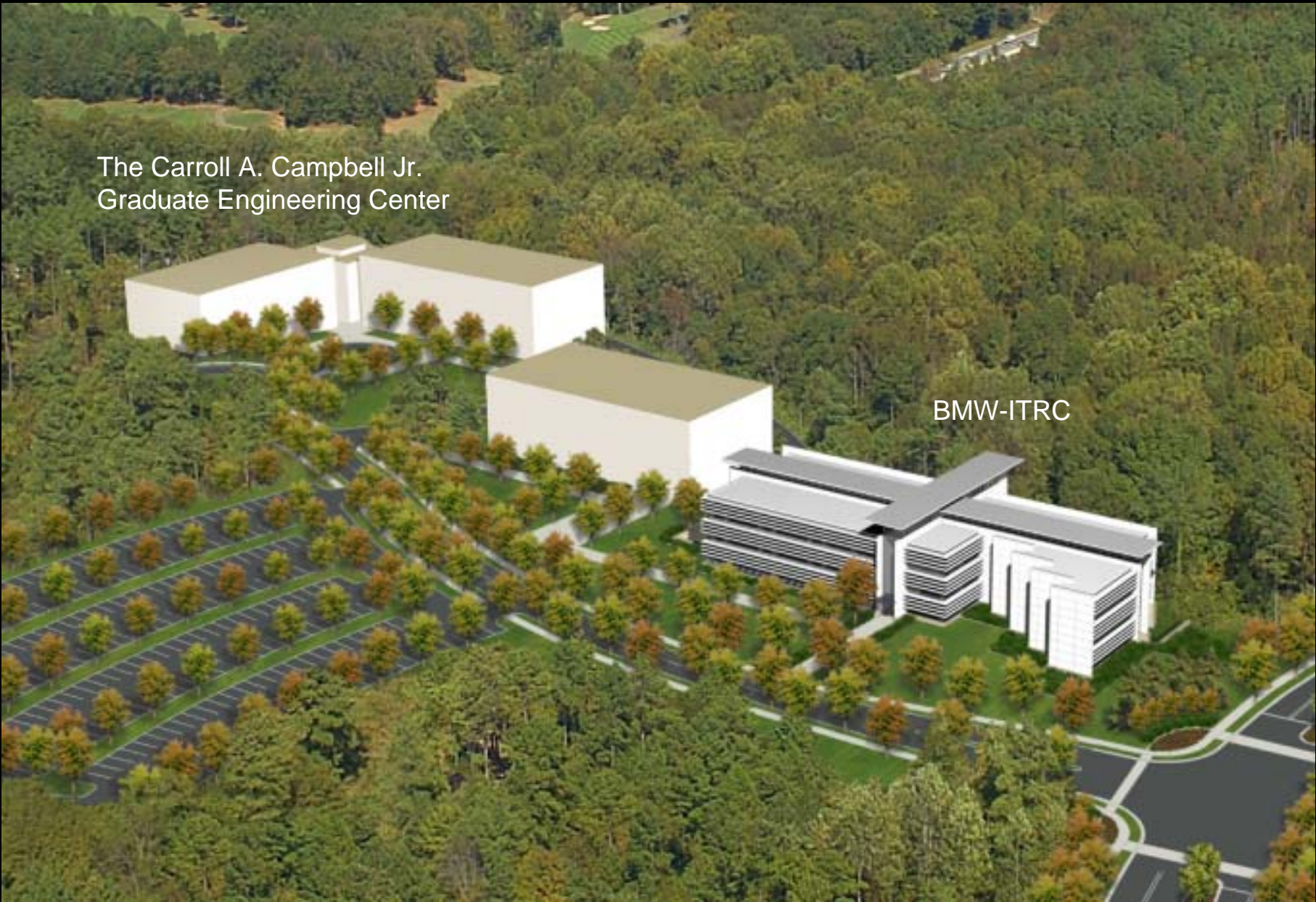


Land:	\$ 7M (inc. \$1.5M from State) \$ 14M (anticipated)
Infrastructure:	\$ 14M
Buildings:	\$ 40M
Faculty:	\$ 31M \$ 5M (anticipated)
Other:	\$ 1.1M
TOTAL:	\$112.1M



The Carroll A. Campbell Jr.
Graduate Engineering Center

BMW-ITRC





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“Driving the Future”



Clemson University’s International Center for Automotive Research is:

- **A powerful statement to the global automobile and motorsports industries about competing in the future.**
- **A key initiative to move Clemson University to one of the top public universities in the country.**
- **A pivotal role in driving the economy of South Carolina with a regional industry cluster model.**