



MICHELIN LAURENS PROVING GROUNDS



***THE ULTIMATE ONE-STOP
TESTING LABORATORY***

MICHELIN'S TESTING FACILITY FOR NORTH AMERICA

When viewed from above, Michelin Laurens Proving Grounds (MLPG) in South Carolina looks like a large motorsports complex. But in reality, it is a vast 3,500-acre scientific laboratory devoted to the research and development of tires and vehicles. MLPG is Michelin's on-vehicle test site for all of North America, and it is one of the largest testing facilities of its type in the world. It is here that Michelin tests and evaluates its tires in a never-ending effort to provide products that deliver outstanding performance, reliability and the highest quality.



A Full-Service Testing Facility

MLPG is also a destination for vehicle manufacturers and others who use it for testing, driver training, special events and more. There are more than a dozen individual test tracks supported by state-of-the-art technology and a highly experienced staff of engineers, professional test drivers and support personnel. Because our customers have all of these resources at their disposal instead of having to arrange for everything on their own, they can focus exclusively on accomplishing their objectives. In fact, many organizations have discovered they can accomplish more here in a single day than they can at multiple other facilities over many days.

Year-Round Testing

MLPG is located between Greenville and Columbia, South Carolina, and within a few hours drive of both Atlanta and Charlotte. With easy airport access and a temperate climate, it's an ideal venue for testing year-round, including most days during the winter.

Safe and Secure

For organizations concerned about security and privacy, MLPG is a perfect solution. Shielded from view by a forest and protected by on-site security, perimeter fencing and other measures, the facility was designed from the ground up to protect against prying eyes and unwanted exposure. In addition, trained emergency medical technicians equipped with fire and rescue equipment are on-site 7 days a week from 6:00 am to 6:00 pm, with special coverage available by arrangement.

Make Your Plans

MLPG is available for lease by organizations for confidential testing and special events. To learn more, please refer to the back of this brochure for contact information.



DRIVER TRAINING / TESTING SUPPORT



Track One (B-2) Wet Skidpad

Our team of professional drivers provide driver training customized to meet your needs. Whether you're focused on improving car control, lap times, or defensive driving skills, our goal is to adapt the training to your skill level and maximize "seat time." MLPG offers a wide variety of state-of-the-art tracks and equipment to accelerate the pace of learning in a safe environment:

- Wet handling track
- Large polished concrete wet skidpad
- Large vehicle dynamics area
- Wet and dry braking surfaces
- Wide range of vehicles and tires
- Low-speed drift car
- High-performance go karts
- Driving simulator
- Data acquisition and analysis

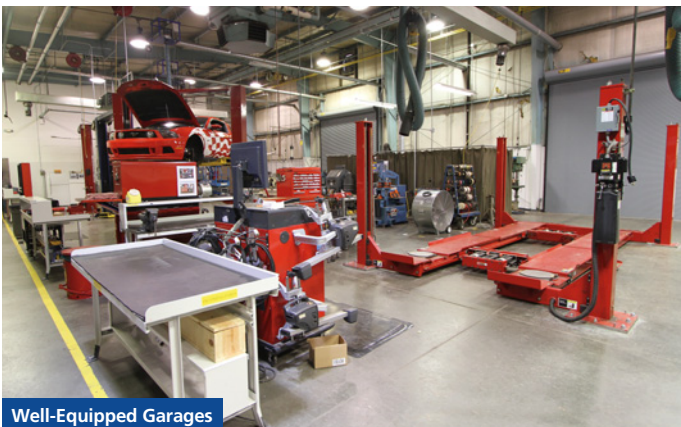
Contact us to learn how we can help with your driver training needs.



Kart Fleet



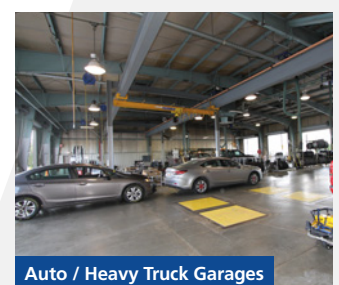
Drift Car



Well-Equipped Garages



Tire Mounting



Auto / Heavy Truck Garages



Track Eight Conference Center



Unique and Ideal Venue for Group Events



Fully-Equipped Conference Center

Michelin Laurens Proving Grounds offers a variety of Ride and Drive experiences, ranging from small group half day events, to large group full day events. Our professional drivers/instructors work hands-on with each participant in Ride and Drive demonstrations versus competitor products to highlight the safety and performance features of Michelin and BFGoodrich tires.

Our on-site conference venues can be comfortably configured for classroom instruction, meetings, and catered dining. Contact our Event Coordinator with inquiries about planning a memorable and informative experience at MLPG for your group.



Ride and Drive



Various Group Sizes



Catering Services

ENGINEERING AND SUPPORT SERVICES



Track Seven Drive-By Noise Testing

MICHELIN LAURENS PROVING GROUNDS OFFERS FULLY CUSTOMIZABLE DATA ACQUISITION SOLUTIONS FOR ALL OF YOUR TESTING NEEDS...



VBox

RACELOGIC DATA ACQUISITION

- 100 Hz GPS data logging
- OBD2 CAN data recording
- Inertial Measurement Units (IMU)
- Dual-antenna set up for precision slip angle measurement
- GPS Base Station capability for 2 cm locational accuracy including lane placement and path prediction capabilities
- Thermocouple measurement
- Analog and digital input recording
- Video VBox recording up to 4 cameras at 10Hz with customizable screen graphics and layout



IMU

COAST-BY AND DRIVE-BY NOISE TESTING EQUIPMENT (PICTURED ABOVE)

- ISO10844:2014 test surface configurable for a variety of external noise tests (R117, R51.02, R51.03, etc.)
- Available for use with most vehicle applications including passenger car, light truck, heavy truck, and electric vehicles

OXTS RT3100 DATA ACQUISITION

- High-grade MEMS IMU for precision motion analysis
- 0.15° slip angle accuracy at 50 km/h in all road conditions
- Survey-grade GPS/GLONASS receivers for ultimate precision
- Low latency, 100 Hz real-time update rate
- CAN, Ethernet, and serial outputs interface with acquisition systems



RT3100



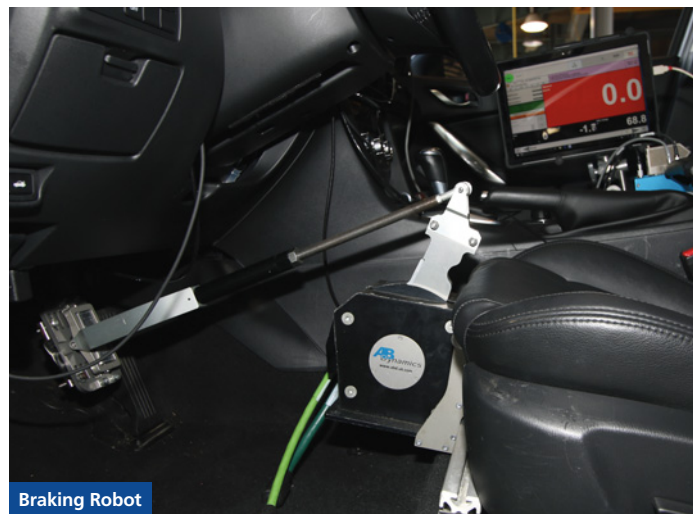
Track One Plateau Wet Grip Testing

TIRE BRAKING TRACTION GRIP MEASUREMENT (PICTURED ABOVE)

- ASTM E 274 and ECE R117 Wet Grip testing offered
- Peak and slide μ measurements
- Tires compared to industry Standard Reference Test Tire or internal witness as desired
- Loads ranging from 280 to 1800 kg for passenger car and light truck tires
- Heavy truck tire testing with loads from 1700 to 5000 kg
- Both wet and dry testing available
- Multiple surface options including polished concrete, low grip asphalt, and high grip asphalt



Wet Grip Test Trailer



Braking Robot

SAE J2909 BRAKING TESTING USING AN ANTHONY BEST DYNAMICS PEDAL ROBOT

- Controlled, repeatable braking tests with consistent pedal force on every stop
- Data can include pedal forces and wheel speeds throughout a stop
- Tuning compatibility for nearly any vehicle



Thermal Image Camera

THERMAL IMAGING CAPABILITY

- FLIR T1030sc camera for 1024 x 768 infrared images at 30 fps
- Temperature range of -40°C to +2,000°C
- Level I certified thermographer onsite



High Speed Camera

HIGH SPEED CAMERA

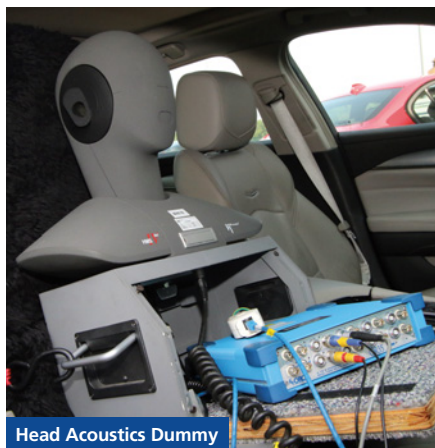
- 1,000 fps at 800 x 600 color resolution
- Multiple camera trigger and signal capabilities



Coast Down Testing Rig

SAE J2263 / J1263 COAST DOWN / ROAD LOAD TESTING (PICTURED ABOVE)

- Passenger car and light truck
- 1066.310 for heavy truck over 14,000 lb GVW



Head Acoustics Dummy

INTERIOR NOISE TESTING CAPABILITY, 0-5000 HZ RANGE

- In-vehicle instrumentation for data collection and analysis using an Oros system and Head Acoustics dummy, or customizable microphone layouts
- Numerous surfaces available for in-vehicle road noise evaluation (weathered asphalt, smooth asphalt, coarse gravel, etc.)



GripTester

MULTIPLE TRACK SURFACE CHARACTERIZATION OFFERINGS

- GripTester measurement
- ASTM E 965 measurement (mean texture sand depth)
- ASTM E 274 Skid Trailer Measurement using ASTM E 501, ASTM E1136 and / or ASTM E 2493 Tires

Note: track monitoring services and equipment are available for external surface monitoring.

CUSTOMIZED TESTING

For more specialized data acquisition needs, Michelin Laurens Proving Grounds offers a flexible National Instruments data acquisition platform that has the capability of recording signals from a diverse assortment of sensor types including:

- String pots
- Thermocouples (including Infrared)
- OBD2 CAN vehicle data
- Accelerometers
- Pressure transducers
- Encoders



Multiple Options Available

DRY SURFACE TRACKS



Track Two

TRACK TWO

- Classic road course
- Maximum dry handling
- Objective understeer (passenger car/light truck)
- 13 turns; 26' total elevation change
- Safety curbing in turns
- Run-off areas in high speed corners
- The APEX building, accessible to Track 2 and Track 3
 - Two garage bays
 - Conference room
 - Observation deck
 - Wi-Fi



Track One Noise & Comfort Loop

TRACK ONE (DRY SURFACE AREAS)

- Noise and comfort loop containing numerous surfaces simulating real-world roads:
 - Smooth asphalt
 - Coarse asphalt
 - Spalled concrete
 - Step-up/step-down
 - Wake-up grooves
 - Cleats of various sizes and spacing
 - Asphalt bumps of various sizes
 - Broken concrete
 - Uneven concrete slabs
- Dry braking area



APEX



APEX



APEX



APEX



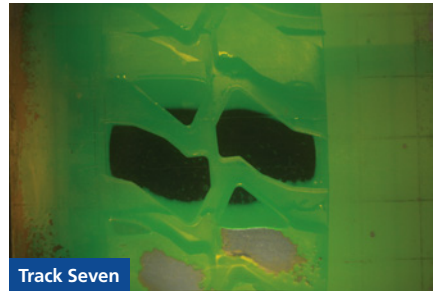
Track Six

TRACK SIX

- Heavy truck loop with dry circular skidpad
- Heavy truck garage bay with four position non-instrumented road wheel (powered rollers)
 - For testing long-term vibration and heat build-up
 - Thermal imaging video

TRACK SEVEN

- Noise evaluation
 - Pass-by and in-car noise
 - Ultra-sensitive noise detection
 - Low background noise
 - Drumming surface (closely spaced undulations accentuate low frequency noise)
- Underground camera
 - Wet footprint photography



Track Seven



Track Seven Drumming Surface



Track Seven



Track Eight

TRACK EIGHT

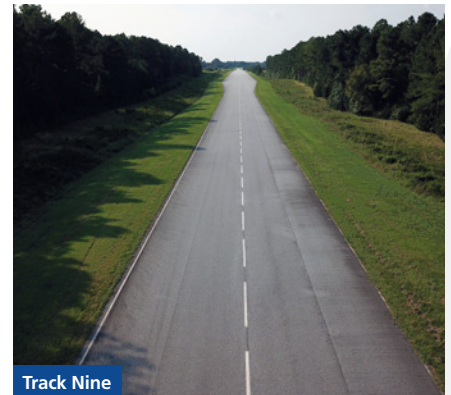
- 14-acre smooth asphalt pad
 - Vehicle dynamics
 - High-speed lane change
 - Handling
 - Autocross
 - Objective on-center and random steer
 - High speed straightaway
 - Large safety run-off area
- Conference Center
 - Includes spacious classroom / conference room with A/V equipment
 - Suitable for various group sizes



Track Eight



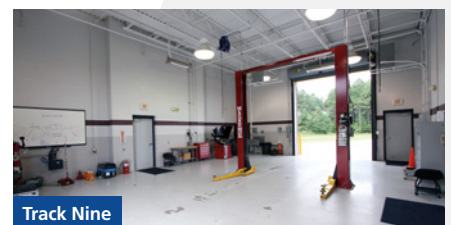
Track Eight Conference Center



Track Nine

TRACK NINE

- Near perfect flatness end-to-end and side-to-side, the entire 4,800' straightaway
- Coast down and drift / pull evaluation
- Vehicle sensitivity
- On-site building with garage bay and conference room



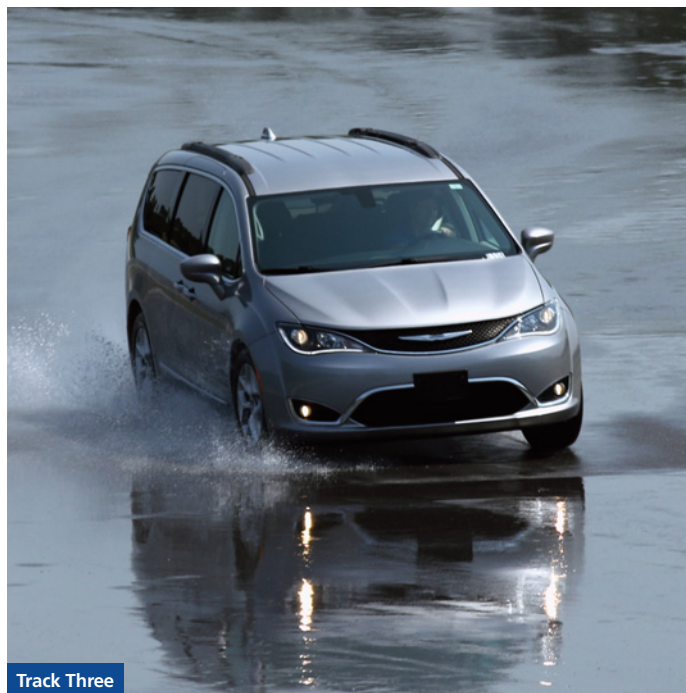
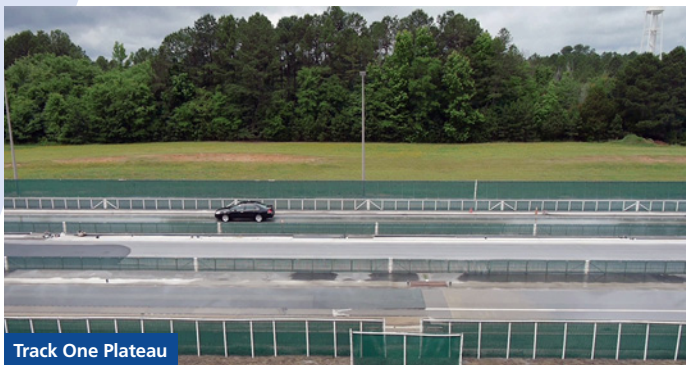
Track Nine

WET SURFACE TRACKS



TRACK ONE (WET SURFACE AREAS)

- Adherence plateau
 - Wet braking and wet traction testing
 - Standard water depth 1.0 mm
 - Four surfaces with different μ values
- Circular skidpads
 - Tracks B1 and B2
 - Wet cornering power and handling, including hydroplaning
 - Water depth sensitivity
 - Dry: Objective understeer test (heavy truck)
 - Standard water depth 0.5mm – 1.0 mm



TRACK THREE

- Wet road course; low friction asphalt
- Wet handling
- Water depth sensitivity
- Lateral adherence (hydroplaning)
- Water depth averages 1.5 mm
- The APEX building, accessible to Track 3 and Track 2
 - Two garage bays
 - Conference room
 - Observation deck
 - Wi-Fi

OFF-ROAD TRACKS



Track Five Circuit

TRACK FIVE (AREA)

- Multiple surfaces for off-road handling and mud traction
 - Gravel/dirt circuit with various turns, surfaces and a mud traction area
 - Hill climb with 28% grade
 - Long mud slope, 9% grade
 - Mogul run, 1' – 4' heights
 - Obstacle area with moguls, wall climbs, stump/rock/log obstacles, gravel and sand bins; for heavy equipment, light truck and 4WD
 - 200' x 20' mud lane, 2' deep



Track Four

TRACK FOUR

- Gravel endurance
- Gravel/dirt straightaway with asphalt loops at each end
- Special raised stone adjacent to straightaway for low-frequency vibration input



Track Five Obstacle Area



Track Five Hill Climb

TRACK EIGHT (OFF-ROAD)

- Off-Road Obstacle Track
 - 1' In-Sine Waves with 25' spacing
 - 1' Out of Sine Waves with 25' spacing
 - 8" – 12" Rip-Rap Pit
 - 8" x 8" Railroad Ties
- 2.0 mile woodland trail circuit

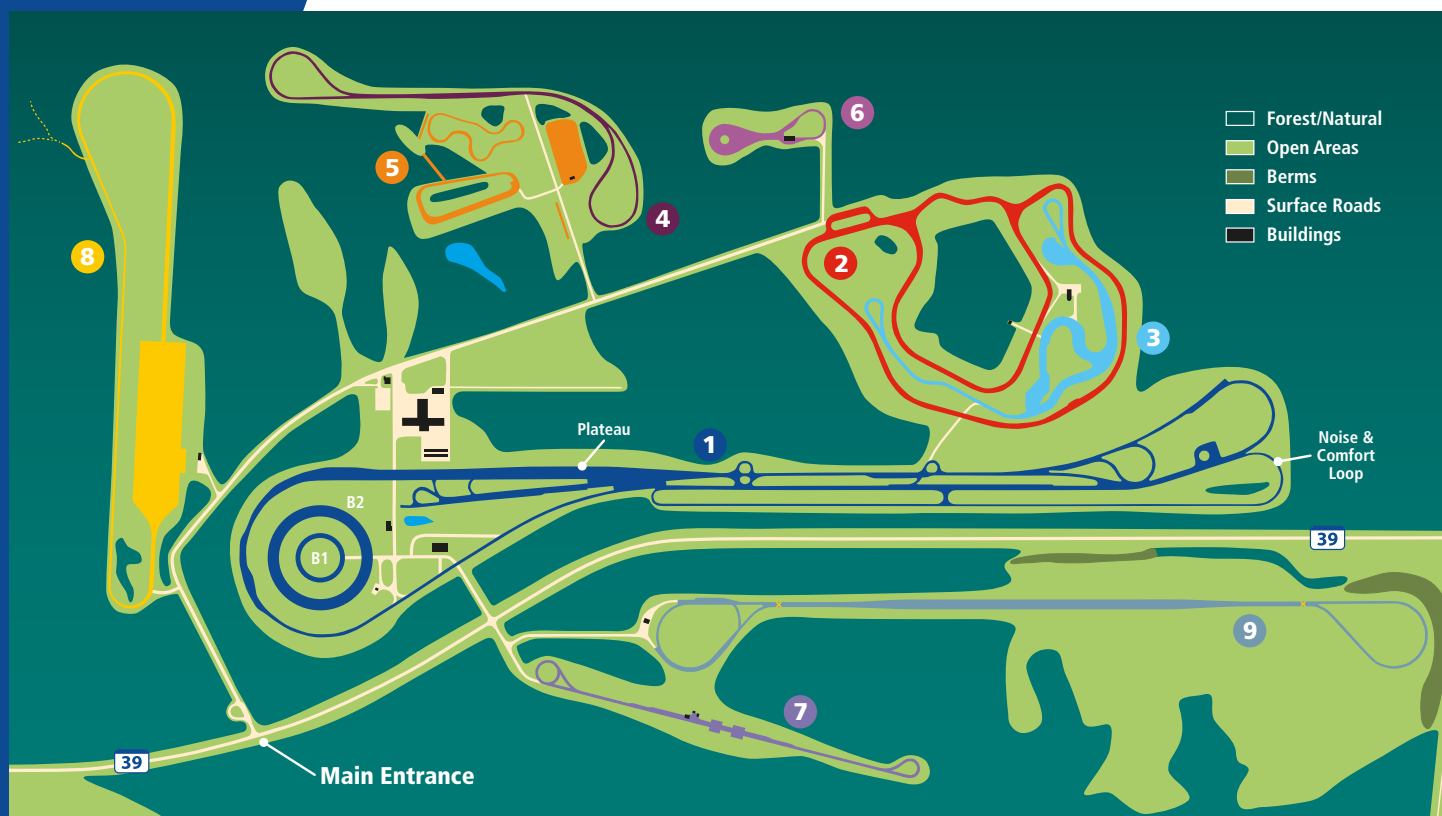


Track Eight Obstacle Track



Track Eight Woodland Trail

MICHELIN LAURENS PROVING GROUNDS



- 1 Main Test Track**
1.7 miles tip to tip, 3.7 miles outer loop
- 2 Road Course**
2.0 miles, alternate configuration of 0.9 mile
- 3 Wet Handling**
0.9 miles, short loop of 0.45 mile
- 4 Gravel Endurance**
0.5 mile straightaway, 1.5 mile loop
- 5 Off-Road Courses**
Multiple areas and inclines, including 1.0 mile circuit
- 6 Heavy Truck Loop**
250' diameter dry skidpad
- 7 Noise**
0.5 mile length (excluding turning loops)
- 8 Vehicle Dynamics**
400' x 1,400' (14-acre) asphalt pad with 2.0 mile loop; Obstacle track and 2.0 mile woodland trail for off-road
- 9 Coast Down and Drift/Pull**
4,800' straightaway, 1.25 miles end to end

CLIMATE

DAILY AVG	HIGH (°F)	LOW (°F)
January	52	29
February	57	32
March	65	39
April	74	47
May	81	57
June	88	66
July	91	69
August	90	68
September	84	60
October	74	48
November	64	38
December	55	31

* Average annual snowfall: 1 inch

LOCATION



2440 Highway 39 ■ Mountville, SC 29370

Located between Greenville and Columbia, SC, off I-385. From Atlanta or Charlotte, take I-85 to I-385, or I-26 to Rt. 49.

CONTACT

Phone: 864-683-1300

Fax: 864-682-4861

Inquiries can be submitted online at:

michelinpg.com

