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Expect high winds in Concord

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This is the calm before the storm in a 40,000-square-foot building nearing completion off Poplar Tent Road in Concord.

Early next year, high winds will howl in a manmade tunnel where site manager Jeffrey Bordner is standing to explain how this unusual testing facility will work.

He's facing a gaping cavity where a 22-foot diameter, 5,100-horsepower fan will blow through a heat exchanger and a honeycomb screen to a race car on a conveyor belt.

This is high technology N.C. bootleggers never could have imagined when they souped up cars to outrun the law during the early days of stock car racing.

Windshear Inc. is developing a $40 million, 180-mph rolling-road wind tunnel that will be the first of its kind in North America and only the third rolling road wind tunnel of its scale.

The company also says the facility near Concord Regional Airport will be the world's first to open its doors to all users for a fee.

For the city of Concord and the Charlotte region, which claims that 90 percent of NASCAR's teams reside within 50 miles of Lowe's Motor Speedway, this looks like a Next Big Thing.

John Cox, who heads the Cabarrus County Economic Development Corp., envisions Formula One teams flying cars into Concord Regional Airport and hauling them over for testing.

The location in the midst of NASCAR country is a plus, he said, but he sees Windshear's potential market as larger: "any automotive manufacturer who wants to test a part."

Two other motorsports wind tunnels are operating in the region, and a competing company has announced plans to start a $63 million wind tunnel next year in Rowan County.

Windshear officials say one of the existing wind tunnels is privately held, and the other doesn't test full-scale cars.

Cox believes the new tunnel could entice more motorsports teams and related businesses to cluster around it, but he hasn't heard at this point of any specific interest.

To help land the wind tunnel, Cabarrus County agreed to three years worth of incentives totaling $626,669 -- equal to 85 percent of the taxes generated by the investment, according to the Cabarrus County Economic Development Corp.

Windshear broke ground in May with Choate Construction as general contractor. It plans to begin operations by April.

The initial technical work force of 11 -- average annual salary $75,000 -- likely will be expanded as demand picks up and the company adds a second shift.

Site manager Bordner met me inside the gate at 1050 Ivey Cline Road this week for an update on construction at the 5-acre tract.

He's employed by Jacobs Engineering Group Inc., which will build, operate and provide test services for Windshear, owned by NASCAR team owner Gene Hass.

Bordner was disappointed he wouldn't be able to demonstrate two of the biggest attractions. The rolling road was undergoing maintenance, and the giant fan hasn't been installed.

The rolling road -- 10.5 feet wide by 29.5 feet long -- is a 1-millimeter-thick stainless steel belt designed to ride on a cushion of compressed air and last up to 5,000 operational hours.

It turns similar to a supermarket conveyor belt but about a gazillion times faster.

Bordner says the rolling road will accelerate from zero to 180 mph in less than a minute.

The equipment is designed to more closely simulate actual movement on the track than stationary measurement devices.

The wind tunnel will accommodate full-scale vehicles (with no driver inside) and provide constant temperatures and airspeeds at angles race cars would encounter on the track.

The honeycombed screen will filter debris from air traveling through the circular tunnel system, and the heat exchanger will help keep temperatures at the test level.

Customers will enter via large garage bays -- concrete block structures with private restrooms, kitchenettes, work desks, work benches, private phones, wireless internet and flat-screen TVs plus air and power for tools.

Race teams are highly competitive, and an information leak could be damaging.

Windshear technicians will help customers set up tests and shuttle vehicles through a private transfer corridor to the wind tunnel.

Everyone must remove the tires on their vehicles and replace them with Windshear's special test tires supplied by Goodyear.

Debris from the tread of a standard tire could be disastrous to the $250,000 rolling road belt.

Bordner said a dimple as small as one on a golf ball could crack the belt and require replacement. Windshear keeps a spare on hand.

Security is paramount at the facility. Customers need clearance, and all test information is purged from Windshear's system after the customer receives it.

Once inside the wind tunnel, the Windshear staff will attach restraints to secure the vehicle on the

rolling road.

Customers will be able to supervise the entire test procedure through a full-width window in the control room.

Monitors display the status of the wind tunnel, where sensors measure drag, down force and side force while rotating the vehicle up to 8 degrees to simulate a turn.

All this high-tech sophistication comes at a price, of course.

Bordner said the starting rate will be $4,500 an hour. But the more hours a customer purchases, the lower the rate goes.

Once the wind tunnel opens to the public early next year, it will operate 24 hours a day every day.

Wind tunnel

- Air flows from the fan to the vehicle and then is collected and returned to the fan in a closed circuit.• Construction of the circuit required 20,000 tons of steel and 2,000 cubic yards of concrete.
- The main fan has a diameter of 22 feet and is rated at 5,100 horsepower.
- The fan is capable of producing a maximum air speed of 180 mph.

ROLLING ROAD

- The "road" is 10.5 feet wide and 29.5 feet long.
- It actually is a 1-millimeter-thick stainless steel belt that rides on a cushion of compressed air.
- A belt costs about $250,000 and will last about 5,000 operational miles.
- If a vehicle remained on the belt for the entire operational lifetime, it would travel 186,000 to 248,000 miles.
- A sensing system in the belt measures the aerodynamic down force under each tire.