



Virtual Reality Training
And Driver Safety

Defcon 5 Studios

CONTENTS

Lets Talk Numbers

1

Accidents/Statistics

Numbers to put driving issues in perspective

2

Current Training Methods

Examine the different types of training methods

3

Simulator Benefits

What are the advantages of simulators

4

Virtual Reality

How does VR simulations compare to traditional simulators

5

Use Cases

Highlight different industries and the affect of VR simulation training

6

New technologies in VR

Look at new technologies in VR that will impact the immersion experience

Let's talk numbers

Accidents /Statistics

- **Weather** (Sudden Visibility Reductions such as snow Pose Big Danger, Ice) –
 - 1,561,430 accidents reported annually.
 - Estimated 57% of all accidents are not reported. Total 2.5+ M. 673k injuries, 7.5k fatalities.
- **Cell Phones** - 24,000 injuries, 995 fatalities
- **Distracted driving worse than drunk driving**
 - Drunk Driving – 4X more likely to crash, needs 4 extra feet breaking distance to react
 - Texting(Distracted Driving) – 8x more likely to crash, needs 70 extra feet more to react
 - Eating and Drinking (Distracted Driving) – 80% more likely to have an accident.
- **Drowsiness** – 5500 fatalities,
- **Aggressive Driving** – 13k accidents, 200+fatalities
- **Unintended Acceleration** – 2000 accidents
- **Cost** - Accidents cost employers \$60 Billion annually and have residual costs of driving up benefit costs

What's in your toolbox?

Current Training Methods



- ❖ Standard class room session
- ❖ Slides and props
- ❖ Books/Handouts/Guides
- ❖ Simulators



- ❖ Computer Based Training
- ❖ Videos
- ❖ Hands on experience the (Gold Standard)



Practice makes perfect

Benefits of Simulators

- Reduce Training Risks –
 - Assets are expensive
 - Consequences can be catastrophic
- Faster Experience
 - More seat time
 - More exposure to scenarios and weather
 - Muscle memory
- Better Auditing
 - Analyze every aspect of the simulation
 - Track historical progress
- Reduce Costs
 - Equipment wear and tear
 - Fuel costs
 - Instructor costs

Why virtual reality?

Standard vs. Virtual Reality Simulations

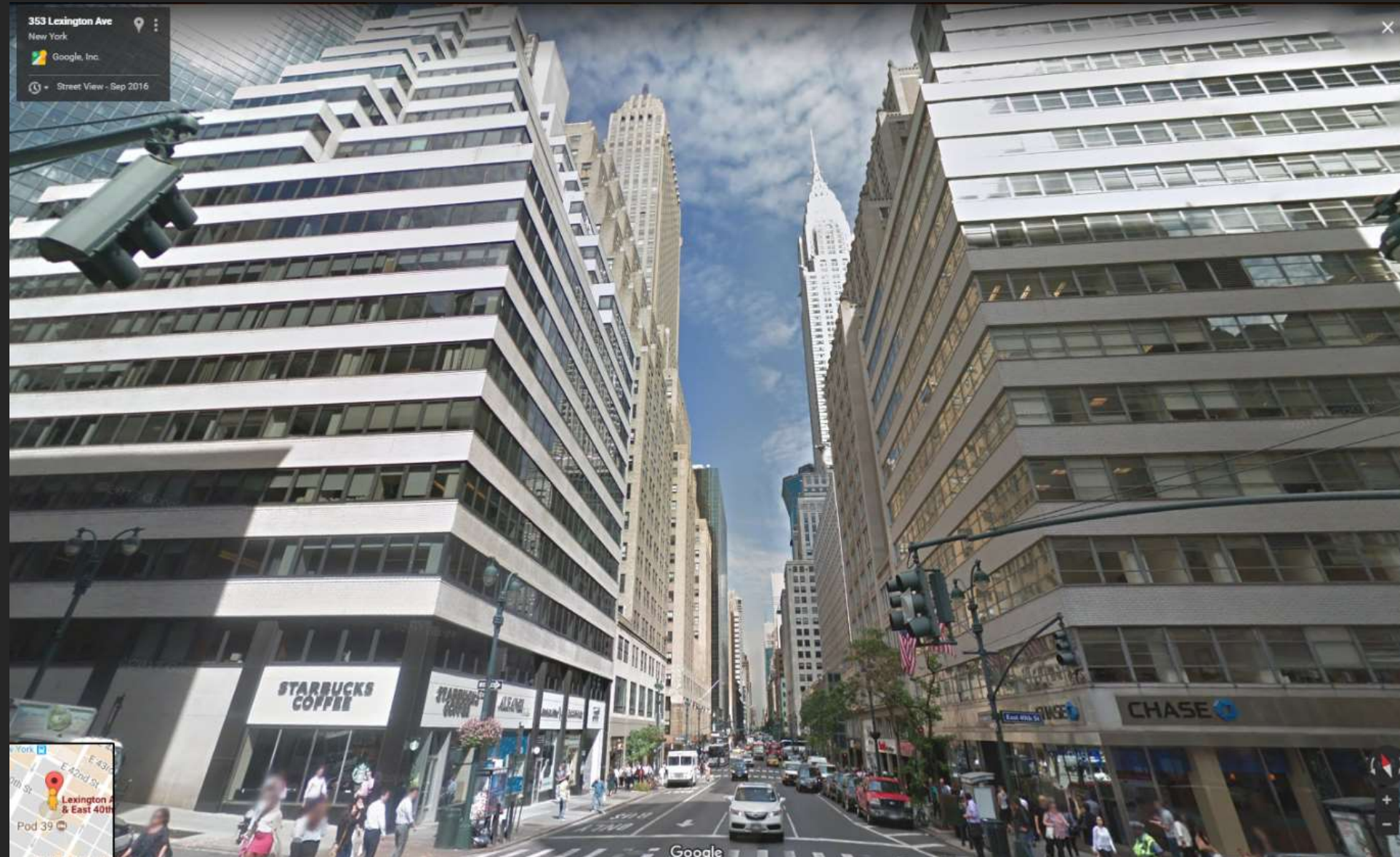


- ❖ Smaller footprint for same functionality
- ❖ Resilient to cabin changes
- ❖ Multi vehicle repurpose
- ❖ Scalable (hardware and software)
- ❖ Fully immersive, evokes emotion
- ❖ Ride along that are not bound by geography
- ❖ Significantly less expensive for similar functionality
- ❖ Multi person simulations



Seeing double

Realism and immersion are key



Proof is in the pudding

Use cases

VR Gallbladder Surgery Use Case

- 29% faster gallbladder dissection
- 9 times less likely to fail
- Five times less likely to injure the gallbladder or burn non-target tissue

VR Forestry Training (after 25 hours of scenarios)

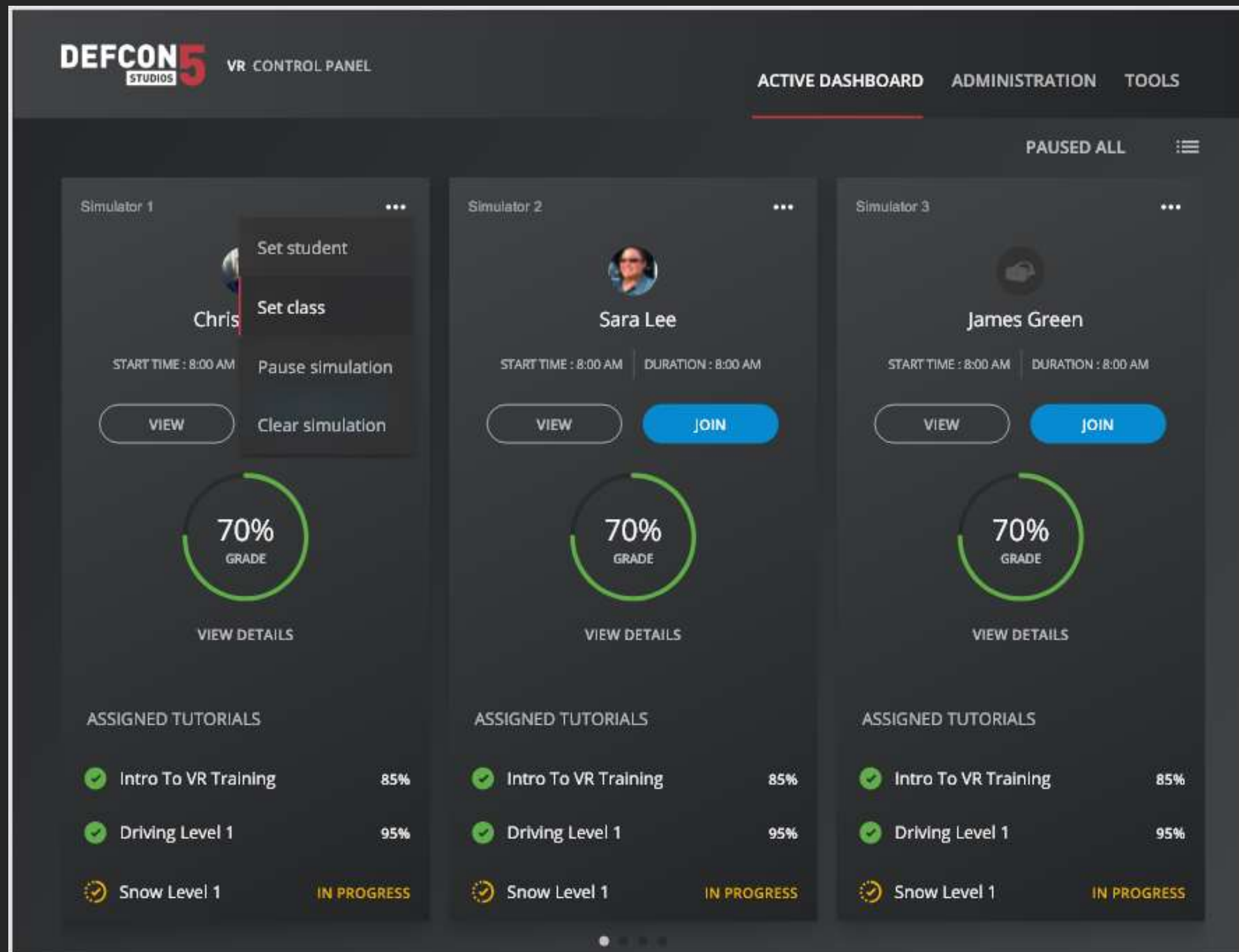
- 23% Increase in harvested wood
- 26% reduction in repair and maintenance costs

Simulator Training Georgia State

- Driving simulators placed in 147 high schools
- Simulations accounting for road hazards, weather, hydroplaning, parking, etc..
- 60% decline in student fatalities (181 teens) a year.

Watch good driving behavior...or not

Teacher Control Panel Good Driving



Simulations can track good/bad behavior

- Make smooth, gradual starts and stops.
- Use reference points to know exactly where your car is positioned.
- Before putting your foot on the gas pedal, see that the targeting path is clear.
- Visualize the Target Area; then evaluate the 12-15 second ranges en route to it.
- When your LOS-POT (Line-Of-Sight, Path-Of-Travel) becomes restricted, reduce your speed.
- Adjust speed and position to keep empty space to the side.
- When you see a red light, reduce speed to time your arrival into a green light.
- Before entering any intersection, check that the left, front right zones are clear.
- When your foot goes on the brake, check the rearview mirror.
- Before moving your vehicle to either side, check your blind spots.
- Keep four seconds of following time from the front vehicle.

What's Next in VR?

Awesomeness



- ❖ 4k per eye. 8k total headset
- ❖ Eye tracking
- ❖ 200 degree FOV

- ❖ Gloves instead of controllers
- ❖ Hand and finger tracking
- ❖ Sensory feedback





THANK YOU!

Any Questions?

Mohamed Ashry