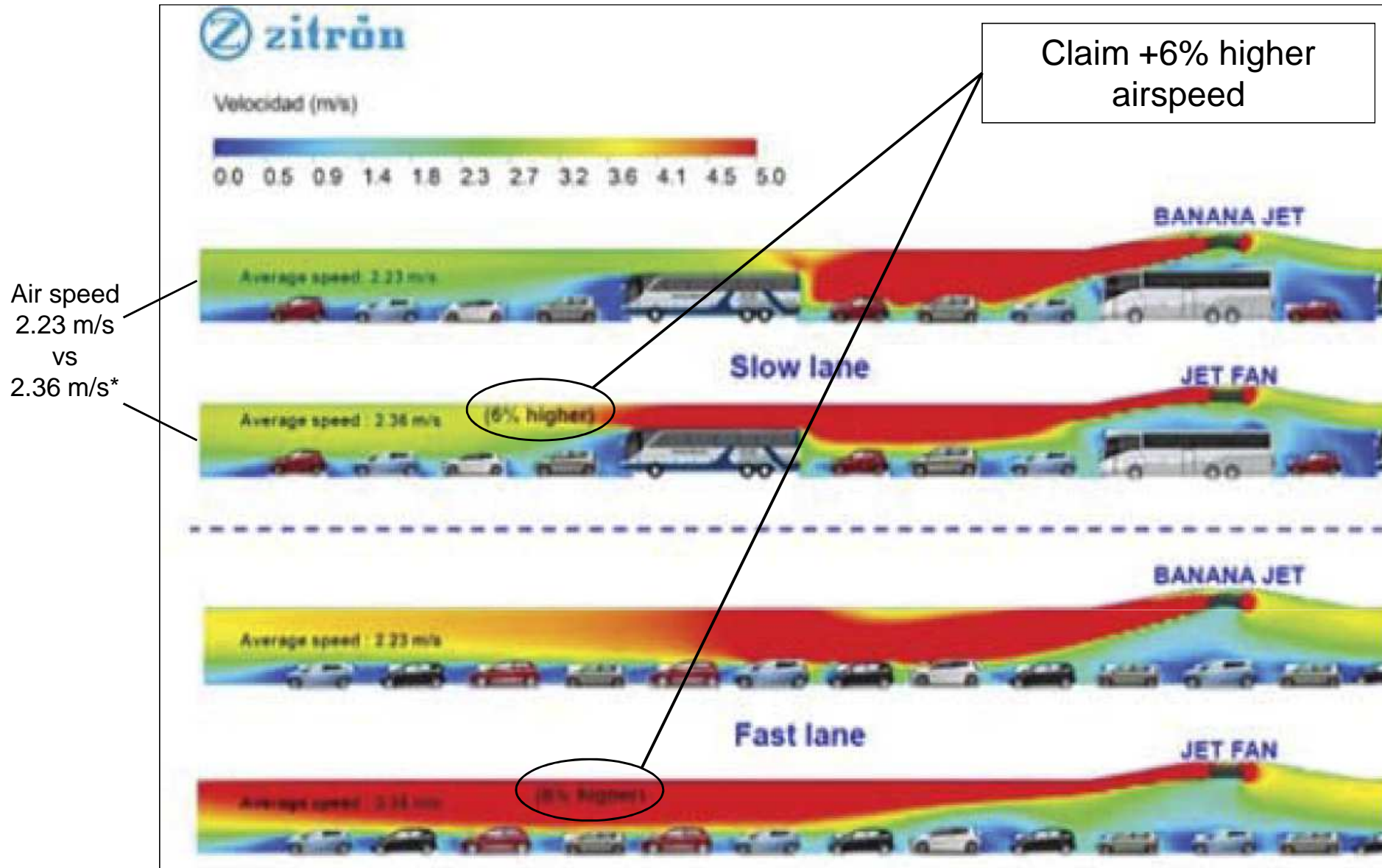


Lies, Damn lies and CFD (or statistics)

*Analysis of intentional misinformation
about Banana Jet[®]*

A competitor's product is supposedly by marginally superior... **IGW Ventilatoren**

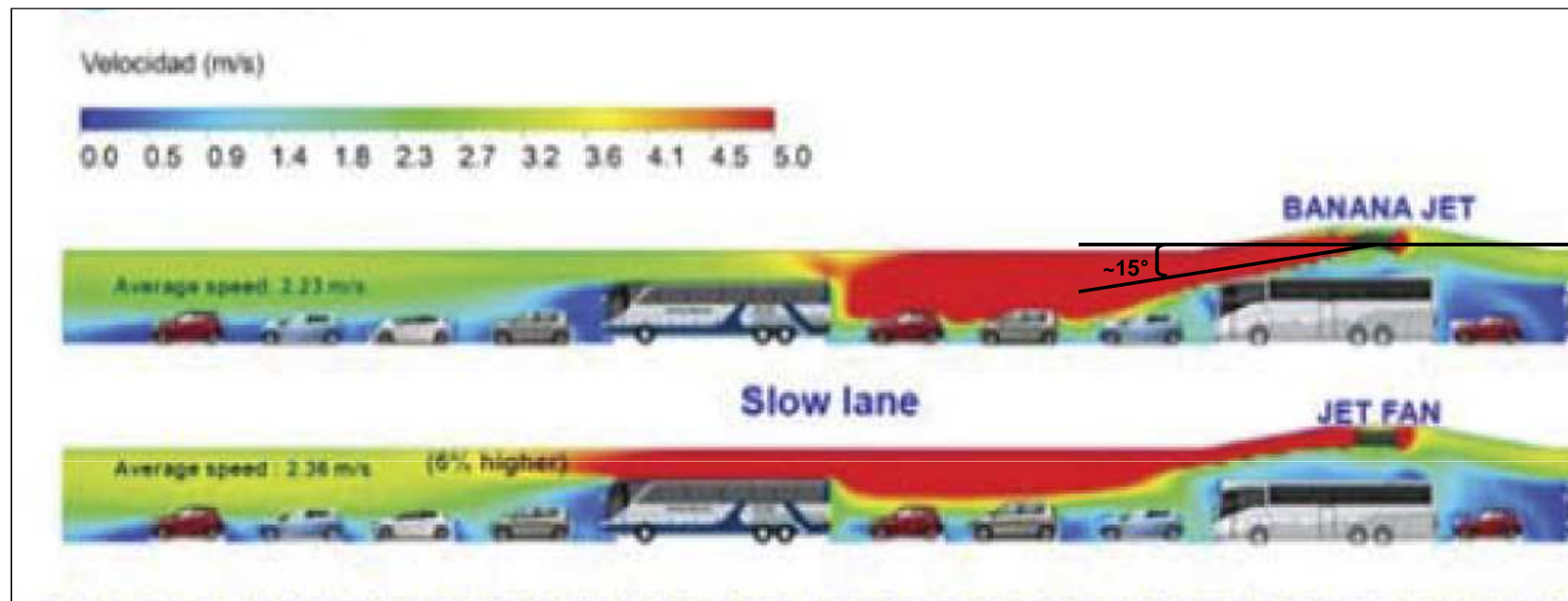


* 2 digit occurring?!

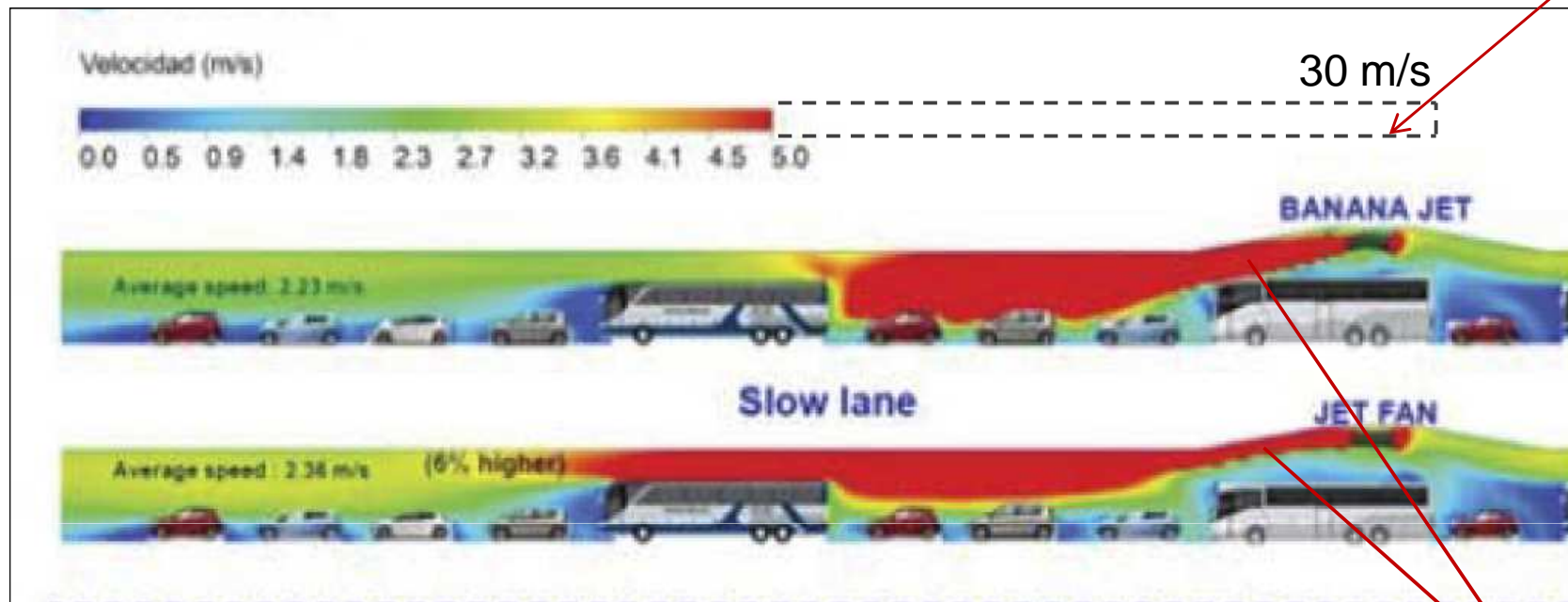
...this is a gross falsification (1): Wrong Banana Jet[®] angle

The Banana Jet[®] angle is wrong (~ 15° instead of 7-8°).

→ Effect: Banana Jet[®] made ~ 10% worse. In reality Banana Jet[®] air speed with 8° angle would at least be 2.5 m/s.



The legend is cut off at 5 m/s. The air speed from a Jet fan is 30-35 m/s at the fans and still 10-15 m/s 20m behind the fan (shown is 5 m/s).



Why has the scale been cut off at 5 m/s?

A third bus?

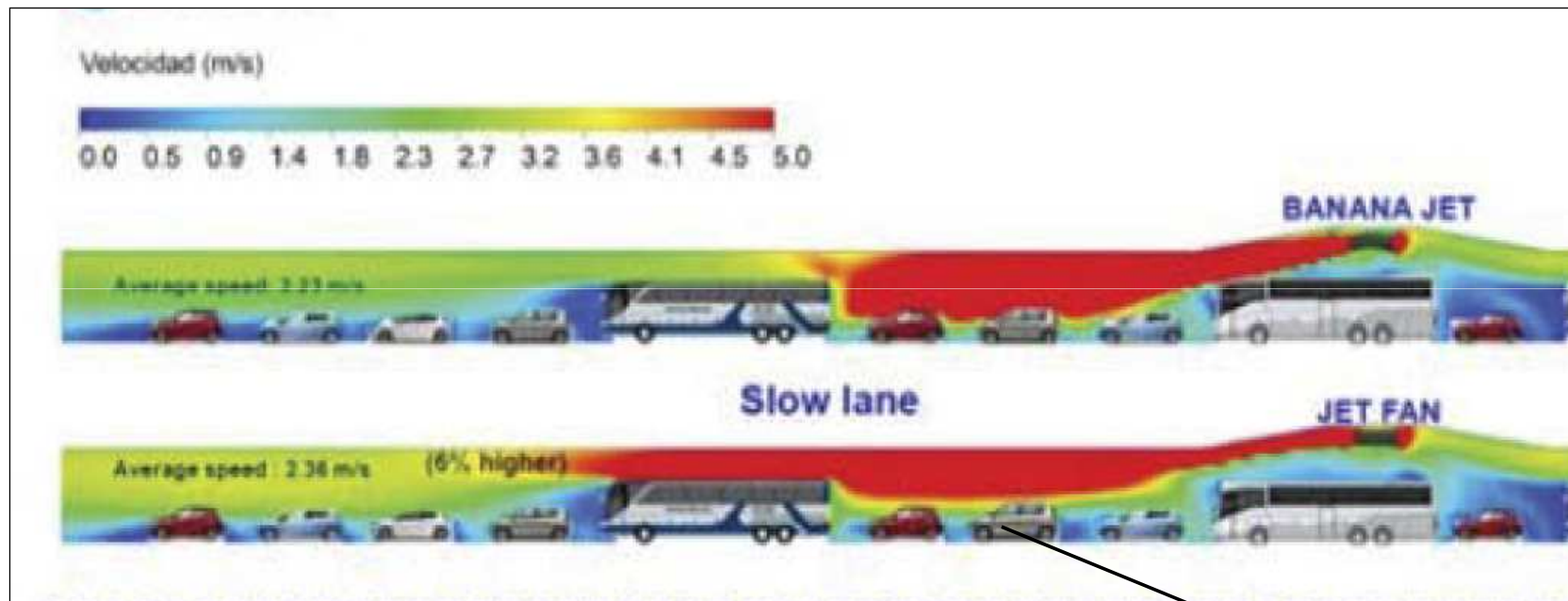
5 m/s?

...this is a gross falsification (3): Jet fan losses omitted

The losses from Coanda effect is obviously not simulated, otherwise there would be a large difference in the colours top to bottom:

- Much higher air speed at the ceiling for the traditional Jet fans (TJ).
- Not so high velocity at the ceiling of tunnel for Banana Jet[®] (BJ).
- Much higher friction losses for TJ fans.

→ Effect: Banana Jet[®] made 10-15 % worse.



Air speed 50% in the middle (compared to ceiling).

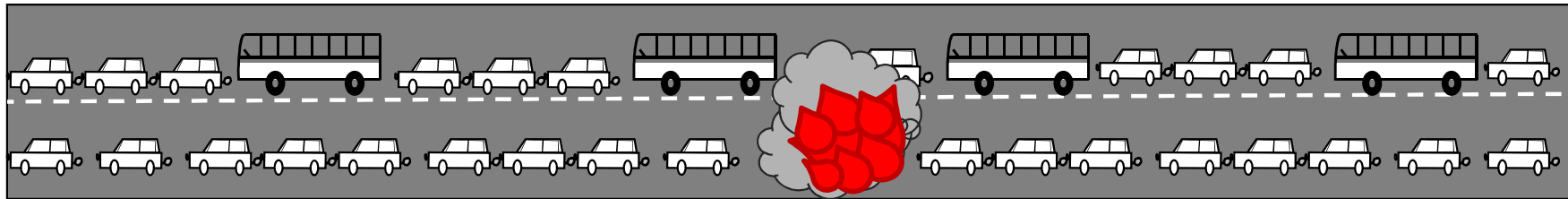
...this is a gross falsification (4): Unrealistic traffic assumption **IGW Ventilatoren**

For the ventilation case (e.g. traffic jam) much lower air speeds are required. This will be further decreased as the proportion of cars with automatic engine shutdown at rest will increasing in the future.

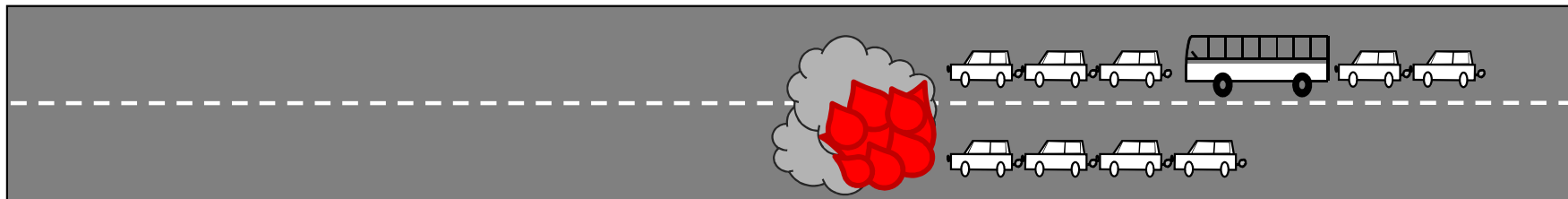
In the fire case it can be assumend that 25-50% of the tunnel is free of cars. For the ventilation in case of a traffic jam much lower air speed is required.

→ Effect: Banana Jet[®] made to 10-15 % worse.

Assumption (Tunnel completely filled with cars):



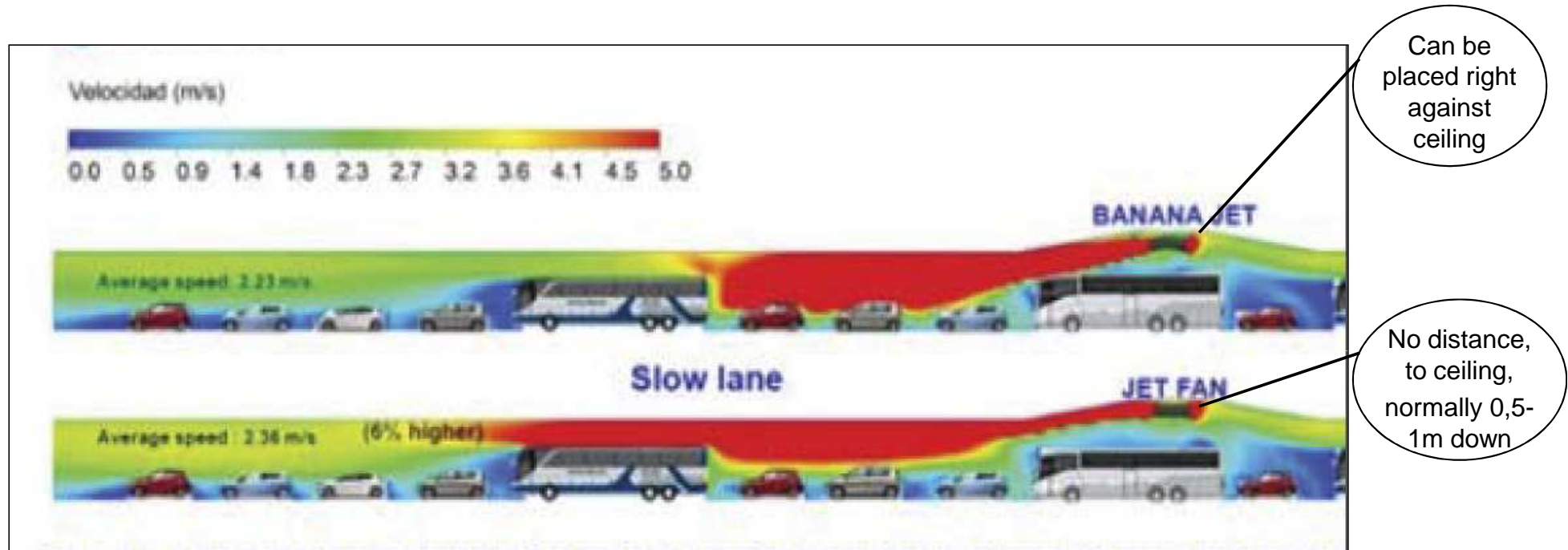
Reality (No cars downstream of fire, upstream only partially full):



...this is a gross falsification (5): Wrong location of fans

Looking at the picture, it seems that the Jet fan has been placed in a niche right against the wall. The almost 30-40% of the thrust lost and the counterflow is not shown and maybe has been ignored.

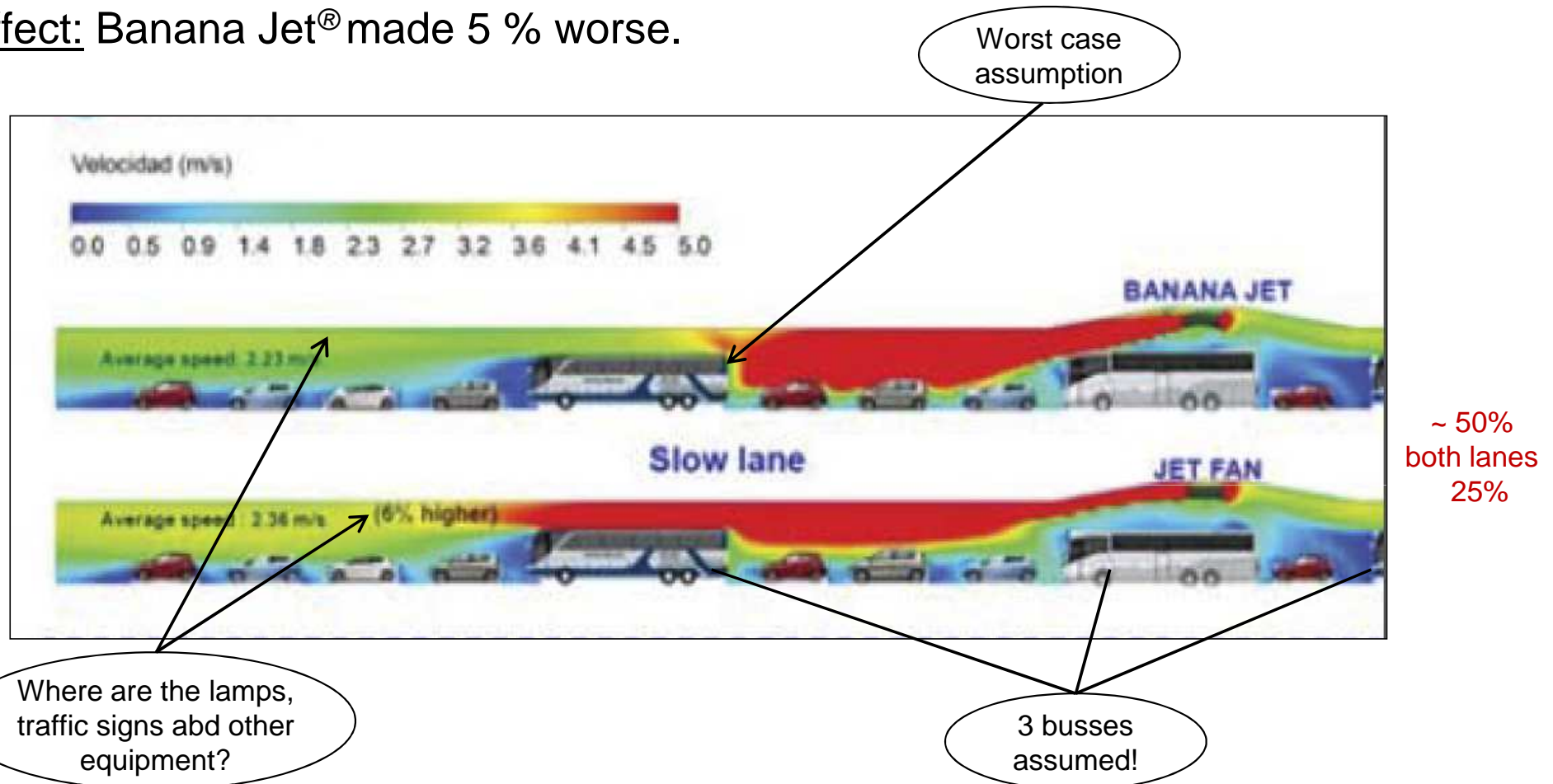
→ Effect: ?



...this is a gross falsification (6): Too many large vehicles

With 3 busses assumed, large vehicles make up ~25% of traffic, instead of normally assumed 10-20%, effect ~ 5%.

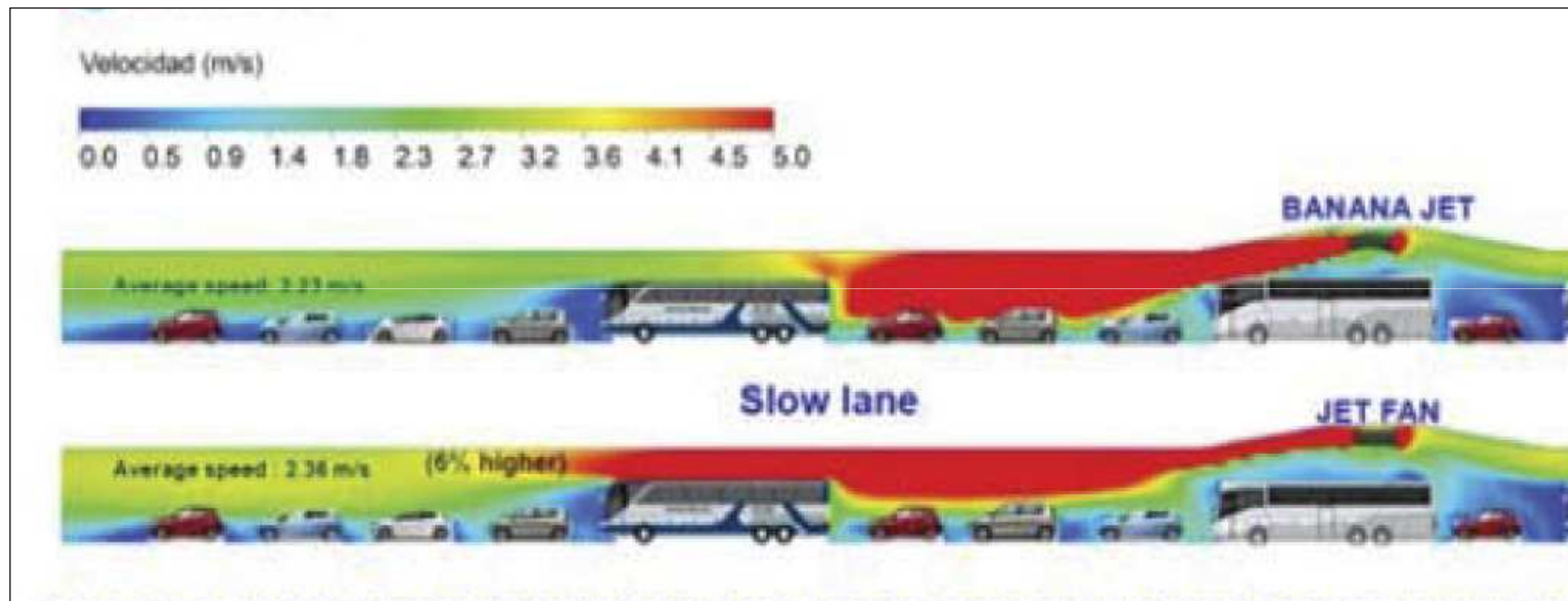
→ Effect: Banana Jet® made 5 % worse.



...this is a gross falsification (7,8,9): Questions, questions...

And some more questions:

- Why is the inlet background velocity not shown much higher for the Jet fans vs. the Banana Jet[®]?
- 6 m height is a very low tunnel, normal is 6,5 - 8m.
- Is the position of the busses choose “randomly”?



Summary

- Even with making so many “false” assumptions the Banana Jet[®] is only 6% worse than traditional Jet fans.
 - The reality, with proper assumptions is at least an advantage of 30-40% for the Banana Jet[®].
 - Instead of **2.36** m/s vs **2.23** m/s Jet fans vs Banana Jet[®] it probably in reality would be **1.5-2.0** m/s vs **2.5-3.0** m/s. Advantage Banana Jet[®].
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