

Review

NASCAR SimRacing - Part 2

SimHQ presents a week-long series on one of the most important simulations ever produced for the Motorsports genre. In Part 2 of SimHQ's NASCAR SimRacing Review we will look at car handling, damage modeling and controllers.

by **Chunx** and **Jens "McGonigle" Lindblad**



Introduction

Like a good NASCAR race, things are heating up as we progress in our review of EA Sport's **NASCAR SimRacing**. Yesterday we focused on the "eye candy", the game's view system, and sound quality. In today's installment we'll be kicking the excitement up a notch as we look at NSR's Physics and AI features.

Handling

Physics

Without a good, realistic physics model, all you have is a cheesy arcade racer instead of a rewarding racing simulation. Of course, you have to keep in mind that no simulation's physics model is "perfect." Ask any military pilot or professional driver, and they'll tell you that their multi million dollar simulators don't "feel" like the real thing. A simulation is only a model of reality, and models can only emulate a handful of life's infinite variables. So, when it comes to physics modeling in a simulation, you have to recognize your limitations and "pick your poison" as to which variables you are going to simulate and which you'll leave out.



With NSR, you have a very different approach to car handling than you did with the "NASCAR Racing" series of simulations. In some respects the physics convey a more realistic "feel", and in some respects they don't.

Tires are the way our cars stay in contact with the road surface. Our chassis set up is simply designed to keep the tires as "stuck" to the pavement as possible. So, as goes the tire modeling, so goes the physics modeling. In NSR, Chunx noticed no significant difference in the traction level of the tires as they heated up in the early laps of a test session or race. It might be there, but it's so subtle you can't tell, and that means you don't have to drive the car with a more delicate hand for the first few laps before the tires heat up, which diminishes the challenge. However, your lap times do come down as you heat up the tires to normal operating temps (around 200° F), which happens after about 3 or 4 laps. You can also tell as the tires wear down that the car gets a little more push in handling, but it doesn't seem to demand a more ginger application of throttle or brake, so less driver technique is involved in going fast over a long run.

That might or might not be realistic for a NASCAR stock car, but it certainly means that individual driver skill will be a much more subtle thing to behold in on-line races than with other NASCAR titles, and there will be less punishment for the driver that over-drives his car in the turns since the tire wear won't impact the car's performance as much. But it will result in a much shorter learning curve for new drivers, which will probably serve to tighten up the racing and keep more virtual drivers in the game rather than giving up altogether.

***"New Realistic NASCAR Physics:
Extensive test driving by NASCAR
drivers helped bring home the true-to-life
feeling of 190-plus MPH racing."
- EA Sports***

Because both Chunx and Jens noted that the tire wear seemed to be less than expected, Jens initiated a more in-depth test of the tire wear model at Martinsville. The mission: To drive the tires to destruction. Upping the tire wear factor to 6X, Jens managed to put in what equates to 312 laps on one set of tires. Interestingly he found that the only tire that degraded notably during the test was the Left Front, which finally blew on the very last lap. The other tires were worn by about one third.

A bit more than halfway through the run Jens found the degradation of the left front tire only caused him to start pushing his braking points further out, slowing his lap times by only 1.3 sec. Since actual NASCAR tires will last less than half the number of laps we tested to (and degrade lap times by more than 1 sec at the end of their life), our test indicates that the tire wear model in NSR is somewhat optimistic when it comes to replicating actual racing tire wear. For three of the tires to easily survive what equates to 312 laps, while the degrading performance of the left front tire could only be felt from lap 210 onwards, indicates EA will need to do some updating to this code in future patches.

One Aspect of NSR's physics model that we enjoyed was the way upsetting a car's balance is modeled. Touch the raised berm, put a tire off the banking at the inside of a turn or get an off-center tap from a competitor and you'll get extreme oversteer, but the onset rate for the oversteer (yaw) is such that it can be corrected and recovered from before your car spins out — if you catch it quickly enough. To Chunx, this aspect of the physics model felt more correct than in other sims, even though it is more forgiving. It also looks more like the kind of car reactions that you seen on TV. But make no mistake — if you find yourself having to massively overcorrect to counter a spin and saving the car, you won't be setting any lap records on that trip around the track.

Chunx also liked the overall brake and throttle response in NSR. You have a good deal of usable travel in the brake pedal and throttle before you break the tires loose, either in skid or spin, respectively. This feature allows more finesse in how you use brake and throttle modulation in a turn to keep the car's attitude optimized all the way around. The feeling is that what you'll get when you ease on the brakes or throttle will be a smoother and more predictable reaction by the chassis, allowing you to better anticipate the car's reaction to the forces you're putting on it. From a physics standpoint, this all makes sense, since when you're working the diagonal corners of the traction

circle, where turning and acceleration/deceleration forces coexist, you cannot be at full throttle and at the lateral traction limit of the tires simultaneously. With NSR, you get good feedback as to how much more throttle or brake the tires will accept while turning. Again, this makes the cars in NSR easier to drive relative to other sims, but that's not necessarily a detractor against the game.

Likewise, drafting physics have proven to be a very robust and challenging feature in NSR. In fact, we might go as far as to say that for NSR, drafting may be its single most noteworthy physics feature — not that it won't frustrate the heck out of you at first. Drafting in NSR requires a great deal more subtlety of technique than in previous NASCAR racing games, and will really challenge the player to master it if one hopes to be competitive at the game's super speedways. One such subtlety is in selection of which pack of cars to draft with. Not every pack is as fast as the other, and as a result the inside line at Daytona isn't always the fastest ticket to the head of the field. While drafting in a 2 or 3 car pack might improve your lap times by a half second, drafting in a pack of a half dozen or more cars can improve your lap times by as much as 2 to 3 seconds. And as you get into the draft of a large pack of cars, you can really feel and see the pull, as your car seems caught in a "tractor beam", pulled ever closer and ever faster towards the bumper of the car in front of you.

But don't hit him too hard, and certainly don't think about abruptly lifting off the throttle or sliding wide and out of position in the turns, because even a slight bauble on the track can put you just a few car lengths back, and that's often enough to lose quickly the draft and get left behind, never to catch up — unless you can hook up with another pack of cars. In fact, the detailed drafting physics of NSR and the resulting demands for precision driving made on the player make driving the super speedways one of the highlights of this game — perhaps making them the most demanding tracks to drive. If there is a flaw in the drafting model for NSR, it seems to lie in the AI's drafting logic — more on that later.



Short track physics have proven to be tough to emulate in past sims, where the models seemed to fall short in terms of replicating how the cars worked the turns at slow speeds and large steering angles. Chunx used the Craftsman Truck Series at Indianapolis Raceway Park's short .69-mile oval, and the Busch Series at Richmond for his evaluation of the short tracks. Here, he thought that NSR's physics were more effective than past sims — with the cars being very predictable in the turns, and more intuitive in terms of how he managed oversteer or understeer to get the truck in and out of the corners smoothly. Although Jens had a slightly lower opinion of the short track physics, overall we still think that NSR does best when emulating the super speedway environment, while short track handling represented the second tier of track physics in the game, and speedways and road courses occupy the bottom rung. On the speedway tracks the cars seemed less convincing, at times acting as if they were weightless.

It is interesting to note that on short tracks and road courses, the Cup car physics weren't very convincing, while the Busch Series cars were better and the CTS trucks felt the most convincing. Based on our experience with RH2004 for F1 Challenge, we'd love to see what would happen, if the Center of Gravity was lowered and the tire grip was reduced by some ambitious 3rd party modder — or better yet in an official EA patch.

While we discovered some welcome aspects of the physics model, we think we found one critical aspect of automobile physics that is highly under-modeled in NSR: weight transfer. The shifting and rate of a car's weight and balance from one wheel or side of the chassis to another has a pronounced effect on its handling characteristics. A car's suspension setup deals almost exclusively with this weight transfer issue. Weight that transfers abruptly or too far will cause the tires to lose grip, which can manifest itself in unwanted understeer, oversteer, or a spin. By first modeling weight transfer, then conveying it to the virtual driver through visual and force feedback cues, the driver is able to alter his driving style to optimize his inputs and thereby better control his car.

This critical aspect of a car's "feel" is robustly modeled in other respected racing games, such as NR 2003 and F1

Challenge's 3rd party mods (such as **RSDG's Sports Car Challenge**) with superb visual, audio and FF cues, but it's a feeling that is noticeably subdued in NSR. In fact it's so subtle that you might not even notice it, unless you really abuse the car. Jens puts it this way: "When most rear-wheel drive cars start fish-tailing (when it makes a series of good "tank-slappers"), the steering wheel will start signaling your hands that weight is being transferred violently from one side of the car to the other in quick succession (i.e. the wheel will start jerking in your hands)."

Chunx tried the CTS and Cup cars at various tracks with several set ups, and found that while weight transfer physics are present, they are so meekly communicated to the driver that you can barely feel the sensation. Likewise, there's little indication to the driver through visual or Force Feedback cues in the steering wheel when the grip (front or rear) is going or gone (although some nice audio cues are provided). Since there is no "seat of the pants" feel when "driving" a PC simulation, weight transfer modeling and cueing are important not only to realistic driving but to player immersion as well. The question is whether NSR has a problem modeling weight transfer properly, or if it simply lacks effective feedback/cueing for the player.



Something that may or may not be related to the weight transfer issue and that seems to happen with any faster speedway setup is a distinct loss in straight line tracking stability. As with the real cars, a fast racing setup in NSR will pull to the left, requiring the wheel to be turned slightly to the right in order to drive in a straight line. But whether due to a controller interface issue, or a physics modeling glitch, straight line tracking is anything but in NSR. A fast setup for cornering turns the car into a wandering, sloppy beast on speedway straights. We even tried to allow for the fact that the front tires had some toe-out built into the setup and that the tires perhaps hadn't reached their optimum working temperature yet, but the slightest movement of the wheel on the back straight usually often leads to an under-damped, divergent fishtailing motion that can quickly put you into the outside wall if you're not very smooth on the controls.

In a flight sim, we'd say this effect causes a "pilot induced oscillation." You'd expect a loose car to be a handful, but not this bad. It almost felt like a deadzone is present in the wheel, even though we have 0% deadzone set in the controller settings options. Due to the immaturity of our set ups and the lack of quality default setups in NSR, it could be that we just don't have the car set up properly. But as it is, this wandering lack of stability is bad news when you're trying to go fast in traffic.



In SimHQ's NSR forum, a reader posed a question about the way your car accelerates out of the pit stall. We did some checking and found that it takes a few seconds after applying throttle to get full throttle response, if you have Auto Clutch enabled. The delay in the automatic clutch's engagement prevents you from getting out of your pit stall quickly, and isn't tied to transmission gear ratio selection. By turning off auto clutch and assigning the clutch function to a wheel button, you can get full throttle almost immediately, and releasing the clutch with throttle added will give you wheel spin and you need to smoke the tires getting out of the pit. But Jens noted that when you do "light up the tires" the resulting burn-out feels odd. The rear wheels spin alright, but the car "feels" weightless, and you can spin the rear wheels at almost any rpm above 3,000, even through gear shifts right through 3rd gear. That seems a little too effortless to us.

Some issues have been noted by several users regarding the ability to drive and recover effortlessly from chassis slip-angles of 12-13 degrees using the default setups. Driving like that feels a bit like *"Drift Racer 3: The Hidden Years..."*

Several tweaks are being offered on different web sites in an attempt to identify and correct this problem. While most point at the differential in NSR being erroneously set as a slip-diff, and not a locked differential as it ought to

be, the tweaks and solutions offered vary, and their effect is still being discussed.

Damage Modeling

In a sim, damage modeling comes in two forms — visual and physics. So, the team set about banging cars into walls and other cars to see what we'd get in terms of physics, then switched to outside view to see what the corresponding visual effects were. We were disappointed to find that small hits and rubs with the wall or other cars leave no indication of contact — this is an area where a graphic feature that leaves "tire donuts" or "Darlington stripe" scrapes on the side of a car would be fantastic for immersion and player involvement, especially considering how much contact is made with the AI cars in this game.

Larger hits will leave dents in the vehicle, but these dents have the saggy look of melted plastic rather than crumpled metal, and look fairly hokey — it certainly lacks the look of crumpling or deformation that you'll see in a real NASCAR wreck. Bigger hits will actually cause panels and bodywork to fly off the car, including bumpers, fenders, hoods, front/rear fascias or wheels, and the debris will stay on the track as obstacles for a prescribed time as determined by your changes to the .plr file settings — assuming you've discovered how to do this by searching various NSR forums, since the manual is of no help here, either...

But the real importance in damage modeling isn't the look of the car, but how it drives after the hit. In general it seems that the damage inflicted isn't in exact relation to the level of the hit. In other words, when Chunx slightly bent the nose of his car, this wasn't necessarily reflected in slower lap times due to diminished aerodynamic efficiency. It seems that in this area, virtual drivers are cut some slack for any errors they make — or maybe it's to cut you some slack for all the slam-dancing you'll be doing with the aggressive AI drivers. But you will definitely pay an aero price for bigger hits. We think we noticed a pleasant surprise in the damage model, when we got the impression that the damage model feels like it can effect your suspension, such that the handling of the car is upset — if we weren't imagining things, that would be a most welcome feature in our opinion. As with most sims, damage that effects the drive train is also modeled.



An unfortunate aspect of the damage model comes via the game's sounds. Whether you are tapped by an AI car or hit so hard that metal is bent, the sound and its intensity are exactly the same. This always leaves you with a burning question as to whether you just suffered mortal damage to the aero efficiency of your car at the faster tracks. Your spotter could be of some help, but usually he'll say "no damage on that one — keep going!" even if you're aero is horribly compromised.

One more thing on driving with NSR's physics and damage models: While it doesn't suffer from Papy's infamous "wall-glue" when rubbing the outside wall in a turn, it could be said that EA has swung the pendulum too far in the other direction, allowing the cars to deflect off the outside walls like small Formula cars. The cars seem to lose all sense of weight and spring back off the wall so quick it's easy for the driver to overcompensate.

Controllers

Both reviewers were disappointed at how hit-or-miss it was to set up our Logitech FF wheels, especially considering that the game recognizes the Momo controller by name in it's setting options. We couldn't tell if there is a bug regarding the interaction of Logitech wheels with NSR or simply a problem with the FF code. Despite years of driving racing sims by Papyrus and ISI/EA, and noting the near-identical similarities between ISI / EA's F1 series controller settings GUI and the Controller GUI for NSR, it still took both of us several hours of tweaking to get our wheels to feel like an actual steering wheel and not



an overgrown game pad.

After first entering the track, Chunx found the Momo FF had strong forces acting on it to pull wheel to outside locks (i.e., towards full turn input) vice centering. This made the wheel a divergent, or negatively stable wheel, and if you so much as relaxed your grip the wheel would start turning and the car would spin out. Definitely not how real cars operate. The fix is to tone down the FF settings in the game to a number below 80% while increasing the forces in the Wingman software. However, I find that with Force Feedback effects on Full, and the slider bar set at 76%, I get a wheel that wants to self center and still conveys the bumps and dips of the track. But getting to this happy compromise took some doing, and my experience with other sims really came into play since the manual was of no help and the lack of tool tips explaining the various features of the game.



Several users have reported not feeling much in the way of Force Feedback effects, and commented upon a dead-zone around center. They also found it hard to feel more than a general spring resistance at center. If you don't feel the rumble from the road, jolts from crashes and a difference in forces when driving on tarmac and when driving on grass, try this:

- Go to advanced controls menu and select the force feedback device type as JOYSTICK.
- Re-assign your controller functions (all buttons, axes, etc).
- Try driving in NSR. If NSR crashes to desktop, restart the game and try to drive again.

If you're lucky, within one or two tries you'll suddenly feel the force feedback kick in, and you should get more responsive and feedback from the wheel. This procedure worked for both Jens and Chunx, but we still feel very little force changes when the tires start losing grip. When the controller-tweaking Guru's arrive, we might get even better effects.

Because of the controller quirks and lack of weight transfer cues, Chunx theorizes that there is something not right about how the game sends Force Feedback signals. As mentioned earlier, the car feels fine turning left, but downright unpredictable turning right at all (such as when adjusting your position down the back straight after passing a car on the inside). Try that, and you might find yourself abruptly pitching into the outside wall without warning, and that just doesn't seem right.

On the other hand, Jens was pleased with the attention to detail evidenced in some of the finer points of Force Feedback cues, as he noticed that you can feel the uneven roughness of the turf when you take an unscheduled trip through the grass, and you can feel the bigger bumps in the road (as well as the roughness of the pavement). Just remember to keep your Force Feedback settings on "Full" to get all the whistles and bells in NSR' FF department.

AI

So critical to any single player simulation, the actions and behavior of the AI cars/drivers in a racing title really affect its overall flavor and reputation. Something that was often overlooked in previous NASCAR titles was the fact that real stock car racing is a "full contact sport." The old stock car saying "rubbin' is racin'" sums up pretty well what you will see on any given Sunday at a NASCAR race. The cars are frequently in contact with one another. Most of the time, there's just a gentle rub or nudge that doesn't do more than leave a scratch or 'donut' on the paint job. Sometimes, there's greater damage, like a bent or torn fender. And of course, too hard of a contact will upset the balance of a car that a spin or wreck ensues.

Previous racing sims have emphasized the latter statement above in their physics and AI behavior. The AI either hit you hard enough to wreck you, or it didn't hit you at all. And that just "ain't" NASCAR racin'. Not so in NSR. Here, there's a bunch 'o beatin' and a bangin' from the AI cars that will upset your car, but not spin it. In fact, you could say there's A LOT of contact with the AI cars. At super speedways, the AI has no problem bump drafting all the time, including in the turns (which has been proven to not work in real NASCAR racing), and the AI will do it so hard that it damages your aerodynamics or even may spin you out. While I applaud the "full contact sport" suitability of NSR's physics model, it seems that the AI tend to overplay this feature in the game, like someone who won't stop telling the same joke over and over until it isn't funny anymore. Real NASCAR drivers have to balance the "rubbin' is racin'" mentality with the reality that a clean, undamaged car runs faster and is more likely to win the race.



Luckily the Rules GUI provides a slider bar that allows the player to adjust the AI's level of Aggressiveness between a rating of 50% to 100%. However, adjusting the aggressiveness level of the AI doesn't seem to significantly alter their behavior unless you drop it all the way down to 50% (the lowest allowed). At 50%, the AI seem to have a more realistic level of aggressiveness on the track while still tapping you and rubbing fenders. Also, the AI doesn't seem to scale its "beatin' and bangin'" mentality based on track venue: in other words, the AI cars will bend their (and your) metal just as much at Martinsville as they will at Atlanta or Daytona, where it's self-defeating to do so for aerodynamic reasons. There should be an AI aggressiveness weighting factor applied automatically to the player's preference by the game engine on a track-by-track basis, so that the AI is always less fanatical at the aero-sensitive tracks.

If EA decided that the AI should have some dramatic 'revenge' motive to their driving style, like a game version of "Days Of Thunder", then they have achieved their goal when the AI Aggressiveness is set anywhere above 75%. But that sort of game feature is best left in an arcade racer, because it's inappropriate in a title that advertises itself as a racing simulation.

Speaking of super speedway aggressiveness, let's look at Daytona: Here, the AI are quite happy to get in line and form drafting packs with each other — but the AI will not get in line with you as the leader of a drafting pack. Rather than joining in and patiently looking for an opportunity to pass you, they constantly attempt to bump you, or slingshot past you at every conceivable (and inconceivable) opportunity — even if it damages their car and reduces its aerodynamic efficiency, and even to the detriment of their track position.

It's this bad behavior from the AI which will prevent you from forming, as Darryl Waltrip puts it, a "co-opitition"

drafting pack in order to catch up to another drafting pack — or to take a drafting pack to the front of the race. But if you let one of the AI cars go to the head of your drafting pack, you can now form an alliance to move faster around the track. I was rather disappointed in the blatant discrimination all the AI cars demonstrate against human drivers when it comes to picking their drafting pack leader!

Another sadly awkward feature to NSR's AI occurs when you set AI strength (or aggressiveness) levels prior to a race (on the Rules Tab of the race track selection page). When you do, you are setting the AI strength for ALL tracks and all series in the game. So if you find you're fast at Daytona and want to drive against the AI at a challenging 100%, but you're still slow at Richmond and want them at a more user-friendly 85%, you'd better keep a running list of what AI strength works best for you at each track in the game, because you'll be moving this slider bar a lot. A better feature would be something that assesses how fast you are at each track you try, and then suggests an AI strength to you for that track — as well as remembering your specific track preferences each time you race there.

In other NASCAR simulations, it was possible to assign various driver and car attributes to a particular vehicle, allowing the AI cars in a race to behave and perform in a manner similar to the actual car they represent. As a season progressed, you could go in and alter these various attributes if a team found more power, or a driver gained in skill. NSR does not appear to have such a feature, and it seems that all the AI cars have the same speed and skills.

In a recent Daytona race, for example, the lead cars in qualifying and in the race were quite random and frequently you'd see cars you would NEVER expect to see leading the Daytona 500 at any time, happily running out front. While it's humorous to see certain "back marker" cars dominating the field at Daytona, it was also a bit of an immersion killer to realize that all AI cars seem to be created equal in NSR.

Part 3 of SimHQ's Review of **NASCAR SimRacing** deals with Telemetry, Chassis Setup and a trip to Jen's Advanced Garage. See you tomorrow!