



Handling Index Analysis

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Endeavor

Size: M | Configuration: Airborne Endeavor M

Trail: 77.2mm	Wheel Flop: 25.3mm	HTA: 69.5°	Fork Offset: 54.0mm
Front Center: 639mm	Chainstay: 430mm	Wheelbase: 1058mm	BB Drop: 75.0mm

AGILITY INDEX™

Score: 68.0/100

32% Ground Trail
26% Wheel Flop
10% Front Center
10% Chain Stay
8% Gyroscopic MOI
6% BB Drop
4% Axle Height
4% Pneumatic Trail

STABILITY INDEX™

Score: 78.5/100

20% Wheel Flop	-9.3
15% Ground Trail	+23.8
15% Front Center	+17.8
15% Gyroscopic MOI	+22.5
10% Chain Stay	0.0
10% Axle Height	-3.8
8% BB Drop	+16.5
7% Pneumatic Trail	+18.6

AGILITY: Higher contributions → more reactive
STABILITY: Higher contributions → more planted

Airborne Endeavor (M) — Titanium Gravel Bicycle Analysis

1. Trail Character

The Endeavor Medium is a versatile adventure-gravel platform designed to thrive on everything from maintained gravel roads to remote fire roads to light singletrack. With 77mm of ground trail and a slack 69.5° head tube angle, this titanium frame delivers the stability and confidence required for multi-surface exploration—whether you're linking county roads into a century loop or loading up for a weekend bikepacking trip. Titanium's natural vibration damping transforms washboard gravel from punishing to manageable, while its corrosion immunity means mud, creek crossings, and sweat won't degrade the frame over decades of adventure riding.

2. Agility Index Analysis — Score: 68.0/100

The 639mm front center creates a moderate-length front triangle that balances responsiveness with predictability—this bike won't dart nervously through loose corners, but it's not sluggish either. The 430mm chainstay sits in the middle of the do-it-all gravel spectrum, providing enough rear-end snap for punchy climbs on hardpack while maintaining traction on loose ascents. The front/rear balance skews slightly toward stability (78.1 vs 68.0), meaning the bike prioritizes composure over quick direction changes—exactly what you want when the surface transitions from smooth gravel to embedded rock without warning.

3. Stability Index Analysis — Score: 78.1/100

The 1058mm wheelbase delivers planted, confidence-inspiring tracking through rough terrain—this bike holds its line when washboard tries to deflect the front wheel, and it descends loose gravel with predictable composure. The 75mm BB drop creates a low center of mass that enhances cornering stability on loose surfaces where traction is variable—the bike leans into gravel corners with reassuring confidence. The 10-point spread between agility (68.0) and stability (78.1) defines this as an exploration-focused gravel bike that prioritizes sure-footed handling over race-day responsiveness, making it ideal for riders who value predictability on unknown terrain.

4. Steering Dynamics

The 77.2mm of ground trail generates substantial self-centering torque—the front end actively wants to track straight, which is invaluable when riding one-handed to grab food or when cross-winds hit on exposed gravel roads. This high trail value creates a steering feel that's deliberate rather than twitchy; turn initiation requires clear input from the rider, but once the bike is leaned into a corner, it holds the line confidently even when the surface transitions from hardpack to loose gravel mid-turn.

The 25.3mm of wheel flop assists turn initiation by creating a mild "falling into the turn" sensation when you lean the bike—this flop value is moderate enough to feel helpful rather than overwhelming, making tight switchbacks on fire roads manageable without the front end diving aggressively. On pavement, the steering feels slightly damped compared to a road bike; on gravel, that same damping translates to reassuring stability when the front tire encounters loose rocks or sand patches.

Surface transitions reveal this geometry's adventure character: moving from pavement to gravel, the bike's personality shifts from "slightly mellow" to "confidently planted." The high trail becomes an asset on loose surfaces, providing predictable steering when traction is limited. In the 15-25 km/h range typical of technical gravel descents, the 69.5° head tube angle and deep trail work together to inspire confidence—the bike tracks predictably even when you're picking lines through embedded rock or navigating washboard at speed. With drop bars providing less leverage than flat bars, this geometry's self-stabilizing tendency becomes a significant advantage—the rider can trust the front end to hold a line without constant correction, leaving mental bandwidth for reading terrain ahead.

5. The Key Trade-offs

The 68.0 agility versus 78.1 stability balance reveals a bike designed for confident exploration over competitive speed. This geometry won't win tight-course gravel races where quick direction changes matter, but it excels on long adventure rides where surface conditions are unpredictable and rider fatigue accumulates over hours. The front-end personality is stability-dominant (high trail, slack HTA), while the rear-end remains moderately responsive (430mm chainstay)—the result is a bike that feels composed descending loose gravel but doesn't feel sluggish when you stand and sprint on hardpack climbs. On mixed-terrain rides that combine pavement, maintained gravel, and rough fire roads, this geometry adapts by feeling slightly over-stable on smooth surfaces and perfectly calibrated on rough ones.

Airborne Endeavor M

RideDNA AI Analysis

6. Loading & Bikepacking Dynamics

The 77.2mm trail makes this geometry highly receptive to front loading—adding a handlebar bag (2-4 kg) or fork cages (1-3 kg per side) enhances the bike's self-centering stability rather than making steering feel heavy. Front weight sits ahead of the steering axis, increasing the self-centering torque that already defines this bike's character; the result is a loaded front end that tracks even more predictably on loose descents and resists crosswinds more effectively.

The 430mm chainstay handles rear loading gracefully—seat bags up to 8 kg and frame bags don't create the tail-wagging instability that plagues shorter-chainstay gravel bikes under load. For this geometry, a 40/60 front/rear weight distribution works well for weekend bikepacking trips, while a 45/55 split suits longer expeditions where front panniers or a handlebar harness carry significant gear. Titanium's predictable compliance under load is a critical advantage here: aluminum frames can feel harsh when loaded, and carbon's stiffness can transmit every vibration directly to the rider, but titanium absorbs the cumulative punishment of rough gravel while maintaining consistent handling whether you're carrying 5 kg or 15 kg of gear.

Loaded handling changes are gradual and predictable—the bike becomes slightly slower to initiate turns but significantly more stable once committed to a line, and the low BB drop keeps the system center of mass planted even when bags raise the load's center of gravity.

7. Fit Context

The 561mm stack and 396mm reach create an upright, endurance-focused position that prioritizes all-day comfort over aerodynamic efficiency—exactly what gravel and adventure riding demand. This fit puts the rider's weight slightly rearward compared to aggressive road geometry, which improves traction on loose climbs and reduces front-end load on rough descents. The 145mm head tube provides ample room for spacers, allowing riders to fine-tune handlebar height for comfort on multi-hour gravel rides without resorting to extremely tall stems.

The 555mm effective top tube creates a cockpit that's roomy without being stretched—riders have space to shift forward for technical climbs and rearward for steep, loose descents. The rider's center of mass sits slightly behind the bike's geometric center (bias toward the rear due to upright position), which enhances rear-wheel traction on loose surfaces but requires conscious weight shift forward on steep gravel climbs to keep the front wheel tracking predictably.

On descents, this fit allows riders to drop their weight rearward aggressively—critical for maintaining control when descending loose, steep fire roads where the front wheel needs to float over obstacles rather than plow into them. The upright position also improves visibility for reading terrain ahead, a significant advantage when navigating unfamiliar gravel roads where surface conditions change rapidly. This geometry serves exploration-focused gravel riders who prioritize comfort and confidence over race-day speed, and who expect to spend 4-8 hours in the saddle on rides that mix pavement, gravel, and rough terrain.

8. Competition Comparison

- ****Scott Addict Gravel (M/54)**:** Trail 69.7mm, HTA 71.0°, CSL 425mm
 - 7.5mm less trail creates noticeably quicker steering; the Endeavor feels more planted on loose descents and crosswinds.
 - 5mm shorter chainstays make the Scott more responsive; identical 45mm tire clearance limits both to similar terrain.
 - Fork A2C 400mm rigid; adding a 30mm gravel suspension fork slackens HTA $\sim 1.9^\circ$ —this geometry degrades significantly with suspension.
- ****Allied Able (54)**:** Trail 72.0mm, HTA 70.5°, CSL 435mm
 - 5mm less trail makes the Allied slightly more responsive; the Endeavor's extra stability suits rougher terrain better.
 - 5mm longer chainstays improve the Allied's loaded stability; both handle bikepacking well but titanium resists impacts better.
 - Fork A2C 410mm rigid; adding a 30mm gravel suspension fork slackens HTA $\sim 1.5^\circ$ —marginal suspension compatibility; longer travel impractical.
- ****Wilier Rave (M)**:** Trail 73.5mm, HTA 70.8°, CSL 421mm
 - 3.7mm less trail creates marginally quicker steering; handling differences are subtle on most gravel terrain.
 - 9mm shorter chainstays make the Rave more agile; the Endeavor's longer rear center handles loads more predictably.

Airborne Endeavor M

RideDNA AI Analysis

- Fork A2C 401mm rigid; adding a 30mm gravel suspension fork slackens HTA $\sim 1.9^\circ$ —geometry was designed for rigid use only.

The Endeavor's titanium construction provides long-term durability advantages that carbon and aluminum cannot match—no paint to chip on rock strikes, no corrosion from mud and salt, and effectively infinite fatigue life under the stresses of loaded gravel riding. The 77.2mm trail is the highest in this group, making the Endeavor the most stable option for riders who prioritize confidence on rough, unpredictable terrain over quick handling on maintained gravel roads.

9. Considerations

The 77.2mm trail strongly benefits from front loading—handlebar bags (2-4 kg) and fork cages (1-2 kg per side) enhance the bike's already-stable steering character by increasing self-centering torque. This makes the Endeavor particularly well-suited to bikepacking setups where significant weight sits ahead of the steering axis.

Handlebar selection: A 44-46cm drop bar with $12-16^\circ$ outward flare provides excellent control on technical gravel descents—the flare widens hand position in the drops for better leverage when steering through loose corners, while the moderate width maintains comfort on long pavement sections. Tire pressure strategy: Titanium's compliance allows riders to run slightly higher pressures (2-3 PSI more) than on stiff aluminum frames while maintaining equivalent comfort—for 50mm tires, start around 28-32 PSI for mixed terrain and adjust based on rider weight and surface conditions. Lower pressures (24-28 PSI) suit soft or sandy conditions, while higher pressures (32-38 PSI) work for hardpack and pavement-heavy rides.

Tubeless setup is essential for this configuration—50mm tires at gravel-appropriate pressures risk pinch flats with tubes, and tubeless allows instant pressure adjustments for changing terrain without carrying a pump. The Endeavor's high trail and moderate wheel flop make it forgiving of front-end weight, so don't hesitate to load the handlebar and fork—this geometry rewards it.

10. Versatility

The Airborne Endeavor platform offers headset angle adjustment from 68.5° to 72.5° HTA, creating a trail range of 60-80mm that transforms the bike's character across the gravel spectrum. The current 69.5° HTA / 77.2mm trail configuration sits in adventure-gravel territory—stable, confident, and well-suited to rough terrain and loaded riding. Steepening the HTA to 71.5° (via $+2^\circ$ headset cup) reduces trail to approximately 67mm, creating a faster-handling gravel bike better suited to maintained gravel roads and gravel racing where quick steering response matters. Slackening to 68.5° (-1° cup) pushes trail toward 80mm, moving the bike into expedition territory where maximum stability under heavy loads becomes the priority.

The fixed 430mm chainstay limits this frame to the middle of the do-it-all gravel range—it won't match dedicated expedition bikes with 450mm+ chainstays for loaded stability, but it's significantly more capable than performance gravel bikes with 420mm chainstays. The 45mm tire clearance (current 50mm tires suggest conservative clearance rating) accommodates everything from 38mm performance gravel tires for fast mixed-surface rides to 45mm expedition tires for soft terrain and maximum comfort. This platform serves riders who want one titanium frame for a decade of evolving gravel goals—race-oriented gravel events with a steep HTA and narrower tires, weekend bikepacking trips in the current configuration, and loaded adventure touring with a slack HTA and maximum tire volume. Titanium's durability means this frame will outlast multiple drivetrains, wheel sets, and component groups while maintaining its ride quality indefinitely.

11. Summary

The Endeavor Medium serves adventure-focused gravel riders who prioritize confidence and comfort on unpredictable terrain over race-day speed. The 77.2mm trail creates a self-stabilizing front end that excels on loose surfaces, rough descents, and loaded bikepacking trips—this is a bike for exploration, not competition. Titanium's vibration damping and corrosion immunity transform long gravel days from punishing endurance tests into sustainable adventures, making this frame a platform for decades of mixed-terrain riding.

Citations

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Airborne Endeavor M

RideDNA AI Analysis

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