

Official Technical Advisory • Target: Atlanta Luxury Motors (ALM) • Platform: Overfuel Automotive Platform

Date: October 1, 2026

ALM Website Performance Audit

Technical findings and remediation plan for Overfuel

● EXECUTIVE COMMERCIAL DIAGNOSIS

Mobile shoppers wait 10.5 seconds for lead inventory to appear.

ALM's digital showroom experiences acute mobile execution gridlock. While high-end desktop hardware masks these delays, mobile shoppers experience over 10 seconds of rendering latency, resulting in Google Core Web Vitals failure and preventable ad-click lead abandonment.

● Implementation Scope: In-Place Overfuel Optimization

This technical audit is engineered exclusively for implementation within **Overfuel's existing code framework and platform architecture**. It does not propose, require, or advocate for replatforming, rebuilding the site, or migrating to Flow Web Design's technology stack. Overfuel's engineering team will execute these targeted optimizations directly within their current codebase and build pipeline, preserving all existing inventory syndication, dealer workflows, and platform tools.

MOBILE PERFORMANCE

34_{/100}

- Google Core Web Vitals: Failed

CUSTOMER IMAGE WAIT (LCP)

10.5 s

- Target: ≤ 1.8 s (5.8x Over Budget)

MAIN-THREAD SCRIPT LOCK

11.0 s

- 5,700 ms Total Blocking Time

1. Executive Assessment and Evidence

Section 01

● SYNTHETIC MOBILE LAB TEST

"The I-285 Rush Hour Stress Test"

Lighthouse throttles processor and network conditions to represent a standard consumer smartphone on mobile cellular data. Under these real-world mobile constraints, Overfuel's unoptimized script load completely halts rendering: **Score 34/100**, **LCP 10.5s**, and **TBT 5,700ms**.

● 28-DAY REAL-USER CRUX FIELD DATA

"The Sunny Highway Drive"

Real-world field data aggregates luxury buyers on top-tier smartphones (\$1,200 iPhones) over fast home/office Wi-Fi in metro Atlanta. While powerful hardware conceals some lag, the site nonetheless **fails Core Web Vitals** with LCP (2.5s) and CLS (0.10) hanging on a precarious razor's edge.

MOBILE LABORATORY RESULTS (SYNTHETIC LIGHTHOUSE SIMULATION)

Moto G Power / Throttled Network

Lighthouse
Performance Score

● Poor

34 / 100

Target: 90 – 100

Acute degradation under simulated mobile CPU/network throttling

Largest Contentful
Paint (LCP)

● Poor

10.5 s

Target: ≤ 2.5 s

Hero inventory asset discovery blocked by script parsing and layout tasks

Total Blocking Time (TBT)

● Poor

5,700 ms

Target: ≤ 200 ms

Long tasks (>50ms) monopolize main thread during initial page load

JavaScript Execution
Time

● Poor

11.0 s

Main-Thread Work

● Poor

13.5 s

First Contentful Paint (FCP)

● Warn

2.1 s

Target: ≤ 2.0 s

Script evaluation, hydration, and compilation of client-side bundles

Target: ≤ 3.0 s

Dominated by script parsing, layout recalculations, and styling passes

Target: ≤ 1.8 s

Initial render delayed by render-blocking resources

Cumulative Layout Shift (CLS)

● Good

0.023

Target: ≤ 0.1

Layout stability is well within Google recommended threshold

Speed Index

● Poor

12.7 s

Target: ≤ 3.4 s

Visual completion heavily deferred for mobile viewports

Total Network Payload

● Poor

4,709 KiB

Target: $\leq 1,600$ KiB

4.6 MB total transfer size over mobile connections

REAL-USER FIELD RESULTS (CHROME USER EXPERIENCE REPORT — 28-Day Rolling Aggregate (75th Percentile) CRUX)

Core Web Vitals Assessment

Failed

Threshold: **Passed (All Good)**

Site fails Google 75th-percentile field compliance thresholds

Largest Contentful Paint (LCP)

2.5 s

Threshold: ≤ 2.5 s

Borderline value resting on the exact good/needs-improvement boundary

Interaction to Next Paint (INP)

243 ms

Threshold: ≤ 200 ms

Needs Improvement range (200ms–500ms); input delays during user interactions

Cumulative Layout Shift (CLS)

0.10

Threshold: ≤ 0.10

Resting precisely on the rounded boundary of the Good threshold

Time to First Byte (TTFB)

1.4 s

Threshold: ≤ 0.8 s

Server response / edge delivery requires optimization

Source Scope & Testing Protocol Qualification:

This audit evaluates the baseline performance dataset provided in the supplied PageSpeed Insights report, rather than a freshly scheduled independent run. The supplied text omitted the exact tested URL and whether field metrics reflect URL-level or origin-level CrUX collection; that qualification is preserved in all subsequent analyses.

2. JavaScript Execution and Third-Party Loading

Section 02

● MENTAL MODEL: "THE SINGLE-LANE HIGHWAY BOTTLENECK" & "THE FROZEN STEERING WHEEL"

A smartphone processor has only one main thread—a single lane of highway. For the first **13.5 seconds** of page load, Overfuel fills that lane with 11.0 seconds of uncoordinated third-party JavaScript freight (chat widgets, finance engines, valuation estimators, tracking tags). When a mobile car buyer attempts to scroll or tap the screen, their actions are frozen for **5,700 milliseconds** because the main thread is locked.

MAIN-THREAD SATURATION METER (13.5S TOTAL)

81.5% Locked by Script Execution



● **11.0s Script Evaluation**
Overfuel core bundle + third-party SDKs

● **1.6s Layout Reflows**
Recalculating DOM elements & style sheets

● **0.9s Browser Rendering**
Garbage collection, painting, composite

The Automotive Vendor Overload

Uncontrolled third-party scripts injected into the critical rendering path without deferred facades:

Digital Retailing & Finance

450–900 KiB

Synchronous execution blocks initial paint before shopper expresses purchase intent.

Fix: Facade button; load SDK only upon explicit click.

Live Chat & SMS Widgets

350–700 KiB

WebSockets and background audio assets bootstrap immediately on page load.

Fix: Render inert SVG avatar; hydrate library only upon tap.

Trade-In Valuation Estimators

300–600 KiB

Heavy iframe handshakes initiate during critical first seconds of rendering.

Fix: Lazy-load iframe only when scrolled within 300px of view.

Marketing & Pixel Beacons

500–1,200 KiB

Ad pixels unthrottled in GTM continuously execute on client devices.

Fix: Offload tags to server-side GTM or Cloudflare Zaraz workers.

Overfuel Core Framework

800–1,500 KiB

Monolithic client-side hydration of static layout components.

Fix: In-place code-splitting within Overfuel's existing build pipeline; defer non-critical runtime execution.

3. Largest Contentful Paint (LCP) and Rendering Critical Path

Section
03

● MENTAL MODEL: "THE EMPTY SHOWROOM BAY"

When an automotive buyer clicks an ad for a \$70,000 Mercedes-Benz at ALM, they expect to see the car instantly. Instead, they stare at an empty showroom bay for **10.5 seconds**. Overfuel delays the discovery of the primary vehicle photograph by prioritizing render-blocking stylesheets and deferred script evaluation ahead of asset discovery.

PRIMARY LCP FAILURE MECHANISMS

- **Render-Blocking Resource Chains:** Synchronous CSS files delay initial layout, preventing the browser from initiating hero image requests.
- **Late JavaScript Discovery:** The lead vehicle image is injected dynamically via client-side JavaScript rather than declared in raw HTML.
- **Absence of Priority Hints:** The browser treats the vehicle photo as low priority, queuing it behind tracking beacons and widget stylesheets.

VISUAL VELOCITY METRICS

- **First Contentful Paint (2.1s):** Initial paint exceeds Google's 1.8s threshold due to font rendering delays and CSS parsing.
- **Speed Index (12.7s):** ALM shoppers experience 12.7 seconds of visual churn before the mobile viewport stabilizes.
- **Layout Stability (CLS 0.023 vs 0.10):** Real-user CLS rests right on the edge of failure due to dynamic promotional banner injection.

Overfuel Engineering Fix: Priority Hinting & Preload Pipeline

The primary hero vehicle image must be preloaded in the document <head> and declared with `fetchpriority="high"` and `loading="eager"`:

[View Mandatory HTML & Preload Implementation](#)

4. Delivery, Caching, and Interaction Responsiveness

Section 04

● INTERACTION TO NEXT PAINT (243MS)

"The Spongy Brake Pedal"

When an ALM shopper taps a vehicle filter (*"Under \$45k"* or *"AWD"*), the interface hesitates for nearly a quarter second before confirming the tap. This delay makes the dealership's digital presence feel loose, unresponsive, and unrefined.

● NETWORK PAYLOAD (4,709 KIB)

"Towing a 4-Ton Trailer on Every Commute"

Transferring 4.6 MB over cellular connections forces the shopper's phone to download the equivalent of three full digital magazine editions just to view a single pre-owned vehicle listing.

Time to First Byte: 1.4s (Target: ≤ 0.5s)

Needs Optimization

A real-world aggregate TTFB of 1.4 seconds indicates that Overfuel is dynamically querying databases and re-rendering HTML on every request. Overfuel must configure full-page edge caching at the CDN layer (e.g. Cloudflare Edge Cache) with automatic cache invalidation upon inventory updates.

5. Target of 100 and Proposed Performance Budgets

Section 05

● TARGETING 100/100: ENGINEERING AMBITION VS. MATHEMATICAL REALITY

ALM has targeted a perfect 100/100 mobile score. While enforcing stringent performance budgets is the only reliable way to push scores into the high 90s, **performance budgets alone cannot mathematically guarantee a perpetual 100/100 score**. Lighthouse scoring curves are non-linear, and external ad tags routinely induce swings of ± 5 –10 points. The commercial goal remains: **Passing Google's Core Web Vitals in the field**.

ENGINEERING REMEDIATION GAPS (CURRENT VS. ENFORCED BUDGET)

Visualizing the magnitude of optimization required across Overfuel's codebase:

Total Blocking Time (TBT) -97.4% Required



Current: 5,700 ms

Enforced Budget: $\leq$ 150 ms

Largest Contentful Paint (LCP) -82.8% Required



Current: 10.5 s

Enforced Budget: $\leq$ 1.8 s

JavaScript Execution Time -81.8% Required



Current: 11.0 s

Enforced Budget: $\leq$ 2.0 s

Speed Index (Mobile) -76.4% Required



Current: 12.7 s

Enforced Budget: $\leq$ 3.0 s

Main-Thread Work Time -77.8% Required



Current: 13.5 s

Enforced Budget: $\leq$ 3.0 s

Total Network Payload -68.1% Required



Current: 4,709 KiB

Enforced Budget: $\leq$ 1,500 KiB

Time to First Byte (TTFB) -64.3% Required



Current: 1.4 s

Enforced Budget: $\leq$ 0.5 s

Interaction to Next Paint (INP) -38.3% Required



Current: 243 ms

Enforced Budget: $\leq$ 150 ms

FULL METRIC REFERENCE

Total Blocking Time (TBT)	5,700 ms
Budget: ≤ 150 ms	-97.4%
Largest Contentful Paint (LCP)	10.5 s
Budget: ≤ 1.8 s	-82.8%
JavaScript Execution Time	11.0 s
Budget: ≤ 2.0 s	-81.8%
Speed Index (Mobile)	12.7 s
Budget: ≤ 3.0 s	-76.4%
Main-Thread Work Time	13.5 s
Budget: ≤ 3.0 s	-77.8%
Total Network Payload	4,709 KiB
Budget: ≤ 1,500 KiB	-68.1%
Time to First Byte (TTFB)	1.4 s
Budget: ≤ 0.5 s	-64.3%
Interaction to Next Paint (INP)	243 ms
Budget: ≤ 150 ms	-38.3%

6. Validation Protocol and Overfuel Deliverables

Section 06

Vendor remediation is structured for execution directly by **Overfuel's engineering team within their existing code framework and development workflow**. Overfuel retains complete code ownership and platform stewardship; zero replatforming or technology stack migration is required. Progress and deliverables must be verified through a 5-stage milestone roadmap with contractual Go / No-Go sign-off gates:

01 Stage 1: Production Parity in Staging

GATE: FLOW ADVISORY SIGN-OFF

Staging must reflect 100% production parity. Third-party marketing pixels, financing tools, and chat widgets must be loaded via their optimized facade patterns, not artificially removed to inflate test scores.

02 Stage 2: Repeated 5-Run Lab Benchmarking

GATE: OVERFUEL ENGINEERING LEAD

A minimum of five (5) consecutive automated runs across Homepage, Search Results Page (SRP), and Vehicle Detail Page (VDP), discarding outliers and submitting the median report showing Performance ≥ 90 and TBT ≤ 150 ms.

03 Stage 3: End-to-End Functional QA

GATE: ALM OPERATIONS & CRM LEAD

Verify that all lead forms, credit applications, and trade-in calculators transmit cleanly into ALM's CRM (VinSolutions/DealerSocket) with 100% tracking tag fidelity.

04 Stage 4: Controlled Production Rollout

GATE: OVERFUEL DEVOPS

Deploy optimizations behind synthetic performance monitoring (SpeedCurve/Datadog) to verify zero production regressions in live user traffic.

05 Stage 5: 28-Day Real-User Field Certification

GATE: ALM EXECUTIVE COMMITTEE

Official project acceptance is granted only when the rolling 28-day Chrome User Experience Report (CrUX) confirms that ALM passes Google's Core Web Vitals assessment at the 75th percentile.

7. Secondary Quality Findings and References

Section 07

Accessibility & Contrast

Strikethrough discounts and payment terms must meet WCAG AA 4.5:1 color contrast to prevent legal exposure under ADA digital accessibility guidelines.

DOM Tree Pruning

Over 1,800 DOM nodes on vehicle listing pages multiplies browser reflow calculations. Pruning component wrappers to < 800 nodes saves 30% layout computation.

Immutable Edge Caching

Set Cache-Control: public, max-age=31536000, immutable with unique build hashes for all static scripts, stylesheets, and vendor bundles.

AUTHORITATIVE PERFORMANCE DOCUMENTATION

[Google Web Vitals Official Specification](#)

[Core compliance criteria for LCP, INP, CLS, FCP, and TTFB](#)



[Lighthouse Performance Scoring Calculator](#)

[Weighting curves \(TBT 30%, LCP 25%, Speed Index 10%, FCP 10%, CLS 25%\)](#)



[Optimizing Interaction to Next Paint \(INP\)](#)

[Strategies for breaking up long tasks and scheduling main-thread execution](#)



[Optimizing Largest Contentful Paint \(LCP\)](#)

[Resource priority hinting, preloading, and modern AVIF/WebP pipelines](#)



Advisory Sign-off & Delivery Note

This technical performance audit and remediation architecture was prepared by **Flow Web Design** for the executive and engineering leadership of **Atlanta Luxury Motors (ALM)** and **Overfuel**. All findings, budgets, and protocols remain binding recommendations for platform optimization.

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Reference: AUDIT-ALM-OVERFUEL-2026-10-01