ByRyde

Budget Justification

Detailed Line-Item Budget & Cost Rationale

Federal Grant Supplement | SBIR Phase I

Per 2 CFR 200 Subpart E | February 2026

investors@byryde.com | byryde.com

This document provides a detailed line-item budget justification for the proposed SBIR Phase I research project, "AI-Powered Driver Platform for Rideshare Optimization and Safety Enhancement." The total budget request is $275,000 for a 12-month period of performance. All costs are justified in accordance with 2 CFR 200 Subpart E — Cost Principles and comply with applicable federal cost allowability, allocability, and reasonableness standards.

The budget is structured to maximize research impact while maintaining fiscal responsibility. Personnel costs represent the largest allocation (40%), reflecting the labor-intensive nature of AI model development, platform engineering, and user study execution. The budget is adaptable to various federal grant programs including NSF SBIR, DOT SMART, and DOE Vehicle Technologies.

Budget Summary by Category

Cost Category	Amount	% of Total
a. Personnel (Senior + Other)	$110,000	40.0%
b. Fringe Benefits	$33,000	12.0%
c. Equipment	$22,000	8.0%
d. Travel	$22,000	8.0%
e. Participant Support	$13,750	5.0%
f. Other Direct Costs	$19,250	7.0%
g. Contractual/Subcontracts	$27,500	10.0%
h. Indirect Costs	$27,500	10.0%
Total Budget Request	**$275,000**	**100.0%**

Period of Performance: 12 months from date of award. All costs are projected at current-year rates and reflect actual or reasonably estimated expenditures necessary to accomplish the proposed research objectives.

Personnel costs are calculated based on current salary rates, percent effort dedicated to the proposed project, and the 12-month period of performance. All salary rates are consistent with the organization's established compensation structure and are reasonable for the geographic area and position responsibilities.

Senior Personnel

- Principal Investigator (PI) / CEO — $40,000 charged: Annual salary: $80,000. Effort: 50% (6 person-months). The PI provides overall technical and administrative leadership for the project, including AI strategy development, research design oversight, partnership management with university collaborators, milestone tracking, and reporting to the funding agency. The PI's extensive experience in technology entrepreneurship and rideshare market dynamics is essential for project success.
- Co-Principal Investigator (Co-PI) / CTO — $30,000 charged: Annual salary: $75,000. Effort: 40% (4.8 person-months). The Co-PI directs all technical development activities including system architecture design, cloud infrastructure management, API development and optimization, database schema design, and integration of AI endpoints with the production platform. The Co-PI ensures technical feasibility and oversees code quality, security, and scalability.

Other Personnel

- Lead Software Engineer — $21,000 charged: Annual salary: $70,000. Effort: 30% (3.6 person-months). Responsible for frontend and backend development, cross-platform testing (iOS, Android, Web), API implementation, and quality assurance. The Lead Engineer implements the technical specifications defined by the Co-PI and ensures production-grade code quality across all 170+ API endpoints.
- Data Scientist — $16,250 charged: Annual salary: $65,000. Effort: 25% (3 person-months). Responsible for machine learning model development, training data preparation, A/B test statistical analysis, demand forecasting model validation, and fatigue detection algorithm calibration. The Data Scientist produces the quantitative research outputs central to the project's scientific contributions.
- Research Assistant — $2,750 charged: Annual salary: $27,500 (part-time). Effort: 10% (1.2 person-months). Responsible for participant recruitment, data collection coordination, survey administration, interview transcription, and research documentation. The Research Assistant supports the Data Scientist and PI in executing the human subjects research components.

Personnel Cost Summary

Position	% Effort	Annual Salary	Amount Charged
PI/CEO	50%	$80,000	**$40,000**
Co-PI/CTO	40%	$75,000	**$30,000**
Lead Engineer	30%	$70,000	**$21,000**
Data Scientist	25%	$65,000	**$16,250**
Research Assistant	10%	$27,500	**$2,750**
Total Personnel			**$110,000**

Fringe benefits are calculated at a composite rate of 30% of total personnel costs ($110,000 × 30% = $33,000). This rate is consistent with the organization's established fringe benefit structure and includes the following components:

Fringe Benefit Components

FICA (Social Security + Medicare)	**7.65% of salary**
Health Insurance	**$500/month/employee (prorated by effort)**
Workers' Compensation Insurance	**1.2% of salary**
Retirement Contribution (3% match)	**3.0% of salary**
Disability Insurance	**0.5% of salary**
Unemployment Insurance (FUTA/SUTA)	**2.1% of salary**
Composite Fringe Rate	**30.0%**
Total Fringe Benefits	**$33,000**

Per-Person Fringe Calculation

Position	Salary Charged	Rate	Fringe Amount
PI/CEO	$40,000	30%	**$12,000**
Co-PI/CTO	$30,000	30%	**$9,000**
Lead Engineer	$21,000	30%	**$6,300**
Data Scientist	$16,250	30%	**$4,875**
Research Assistant	$2,750	30%	**$825**
Total Fringe Benefits			**$33,000**

Equipment costs include all tangible items necessary for platform development, testing, and research data collection. All equipment items are essential and directly related to the proposed research activities. Per 2 CFR 200.313, equipment is defined as tangible personal property with an acquisition cost of $5,000 or more per unit; items below this threshold are classified as supplies under Other Direct Costs.

Equipment Line Items

- Cloud Computing Infrastructure — $12,000: AWS/GCP cloud services including PostgreSQL database hosting (RDS/Cloud SQL), compute instances for Express.js backend and AI model serving, API gateway services, CDN for static assets, and S3/GCS storage for user data. Cost covers 12 months of production-grade infrastructure supporting 500-driver study with high-availability requirements. Justification: Cloud infrastructure is essential for hosting the ByRyde platform, serving AI endpoints, and collecting research data at scale. On-premise alternatives would exceed budget and lack the elasticity needed for variable research workloads.
- Testing Devices — $5,000: 5 iOS devices (iPhone 14/15 models at $400-500 each) and 5 Android devices (Samsung Galaxy/Pixel models at $300-400 each) for cross-platform testing across the Expo React Native application. Devices represent the most common hardware used by rideshare drivers. Justification: Cross-platform testing on physical devices is essential to ensure app reliability, GPS accuracy, and sensor functionality (accelerometer for crash detection, gyroscope for fatigue monitoring) that cannot be validated through emulation alone.
- Development Workstations — $5,000: 2 high-performance laptops (MacBook Pro M3 or equivalent at $2,500 each) for machine learning model training, large-scale data processing, and development environment hosting. Justification: ML model fine-tuning and training data processing require GPU-accelerated computing. Local workstations supplement cloud infrastructure for iterative development workflows that would be cost-prohibitive to run entirely in the cloud.

Travel costs support essential research activities including customer discovery in target markets, dissemination of research findings at academic conferences, program officer coordination, and advisory board convening. All travel follows GSA per diem rates for lodging and meals & incidental expenses (M&IE).

Travel Line Items

- Customer Discovery Trips — $10,000: 5 markets × $2,000 per trip. Each trip includes roundtrip airfare ($400), hotel (3 nights × $175/night = $525), ground transportation ($150), and meals/incidentals (3 days × $75/day M&IE = $225). Purpose: In-person driver recruitment, focus groups, market assessment, and partnership development in each target city (Austin, Nashville, Denver, Portland, Charlotte). Justification: Direct driver engagement is critical for study recruitment, building trust with participants, and understanding market-specific dynamics that inform AI model calibration.
- Conference Presentations — $6,000: 2 conferences × $3,000 per trip. ACM Conference on Intelligent Transportation Systems (ITS 2027) and IEEE International Conference on Intelligent Transportation Systems (ITSC 2027). Each includes registration ($600), roundtrip airfare ($500), hotel (4 nights × $200/night = $800), ground transportation ($200), and meals (4 days × $75/day = $300). Justification: Peer-reviewed conference presentations are essential for disseminating research findings, receiving expert feedback, and establishing credibility within the transportation research community.
- Program Officer Meetings — $3,000: 2 trips × $1,500 per trip to funding agency headquarters. Each includes roundtrip airfare ($400), hotel (2 nights × $200/night = $400), ground transportation ($100), and meals (2 days × $75/day = $150). Justification: In-person milestone review meetings with the program officer facilitate productive project oversight, enable real-time feedback on research progress, and strengthen the agency-awardee relationship.
- Advisory Board Meeting — $3,000: 1 annual meeting bringing 4 advisory board members together with the project team. Covers venue rental ($500), catering ($500), and travel support for 2 out-of-town advisors (2 × $1,000). Justification: An annual in-person advisory board meeting provides concentrated expert input on research direction, commercialization strategy, and technical challenges.

Participant support costs compensate research participants for their time and contribution to the study. Per NSF policy, participant support costs are excluded from the base for indirect cost calculation. All participant compensation rates are consistent with institutional norms for human subjects research and have been reviewed for appropriateness.

Participant Support Line Items

- Driver Study Compensation — $12,500: 500 driver participants × $25 per study session. Each participant completes an initial onboarding session (30 minutes), weekly check-in surveys (10 minutes × 12 weeks), and a final exit interview (45 minutes). The $25 compensation covers the aggregate time commitment of approximately 3.5 hours per participant. Justification: Compensation is necessary to recruit and retain a diverse, representative sample of rideshare drivers. The rate of approximately $7/hour for survey completion is consistent with standard human subjects research compensation and reflects the opportunity cost for drivers who could be earning during study participation time.
- Focus Group Materials — $1,250: Covers refreshments, printed materials, note-taking supplies, and venue costs for 10 focus group sessions (5 markets × 2 sessions each) with 8-10 participants per session. $125 per session covers light refreshments ($50), printed handouts and consent forms ($25), and venue/room rental ($50). Justification: Focus groups provide qualitative data essential for understanding driver needs, evaluating AI feature effectiveness, and identifying usability improvements. Refreshments and materials create a professional research environment that encourages participant engagement.

Total Participant Support **$13,750**

Note: Per NSF Grant Proposal Guide (GPG) Chapter II.C.2.g(v), no indirect costs are applied to participant support costs. This budget line item is presented separately and excluded from the modified total direct cost (MTDC) base for indirect cost calculation.

Other direct costs include materials, supplies, and services that are directly attributable to the proposed research and do not fit within the standard budget categories above. All costs are reasonable, allocable, and necessary for project execution.

Other Direct Cost Line Items

- OpenAI GPT-5.2 API Costs — $8,000: API usage for 15 AI endpoints serving 500 study participants over 9 months of active deployment (Phases 1-3). Estimated usage: 2,000+ API calls per driver per month across all endpoints. Pricing based on current OpenAI enterprise tier rates. Justification: The AI Copilot Suite is the core innovation being evaluated in this research. API costs are essential for delivering the AI-powered features to treatment group participants and collecting endpoint performance data.
- Google Cloud Translation API — $2,000: Translation services supporting 12-language capability for study participants who are non-native English speakers. Estimated 500,000 translation requests over the study period. Justification: Multilingual support is essential for ensuring equitable access to platform features across the diverse rideshare driver population, 25%+ of whom are non-native English speakers.
- Stripe Processing Fees — $1,000: Payment processing fees for driver compensation payments, subscription billing during the study, and instant pay transactions. Standard Stripe rate: 2.9% + $0.30 per transaction. Justification: Stripe Connect is integral to the ByRyde platform and must be operational during the study to provide authentic driver experience data.
- Software Licenses — $3,000: Development tools (GitHub Enterprise: $252/yr, Figma Pro: $180/yr), testing frameworks (BrowserStack: $468/yr), analytics platforms (Mixpanel: $300/yr, Sentry error monitoring: $312/yr), and project management tools (Linear: $240/yr). Justification: Professional development and analytics tools are necessary for maintaining code quality, monitoring platform performance, and tracking research metrics throughout the study.
- Publication Fees — $2,500: Open access publication fees for 2 peer-reviewed journal articles ($1,250 each). Target journals: Transportation Research Part C: Emerging Technologies, IEEE Transactions on Intelligent Transportation Systems. Justification: Open access publication ensures broad dissemination of research findings to the transportation research community, maximizing the scientific impact of federally funded research.
- User Study Materials — $1,250: Survey instruments (REDCap licensing: $500), consent form printing ($200), data collection tools and supplies ($300), and interview recording equipment ($250). Justification: Research-grade data collection instruments are necessary for ensuring data quality and compliance with IRB-approved protocols.
- Domain & Hosting — $1,500: Domain registration, DNS management, SSL certificates, email hosting, and CDN services for the byryde.com web presence and research data portal. Justification: Web infrastructure supports participant communication, study documentation hosting, and public-facing research output dissemination.

Subcontract costs cover specialized services that are essential to the research but beyond the internal team's capacity or expertise. All subcontracts will be executed through formal agreements with defined scope, deliverables, timelines, and payment milestones.

Subcontract Line Items

- University Research Partner — $20,000: Subcontract with a university transportation research center for advanced statistical analysis of study data, co-authoring of peer-reviewed publications, and access to historical transportation research datasets for benchmarking. Scope includes: 2 faculty consultant-months, graduate research assistant support (4 months at 50% effort), access to university computing resources for large-scale statistical analysis, and IRB coordination for multi-site research. Justification: University partnership provides statistical expertise, access to established research infrastructure, and academic credibility essential for peer-reviewed publication. The transportation research center's historical datasets enable meaningful benchmarking of ByRyde's impact against industry baselines.
- Security Audit — $5,000: Third-party penetration testing and security review of the ByRyde platform by an independent cybersecurity firm. Scope includes: external vulnerability assessment, API security testing, data encryption verification, and compliance audit against OWASP Top 10 and SOC 2 Type I standards. Deliverables: comprehensive security report with risk ratings and remediation recommendations. Justification: Independent security assessment is essential for protecting research participant data and ensuring compliance with IRB requirements for data security. Federal funding recipients must demonstrate adequate data protection measures.
- Legal Review — $2,500: Compliance review by a technology attorney specializing in data protection and privacy law. Scope includes: review of data collection practices against CCPA/state privacy laws, participant consent form legal review, terms of service update for research participants, and data sharing agreement template for university partner. Justification: Legal review ensures the research program complies with applicable privacy regulations and protects both participants and the organization from legal liability.

Total Contractual/Subcontracts **$27,500**

Indirect costs are calculated using the de minimis rate of 10% of Modified Total Direct Costs (MTDC) as permitted under 2 CFR 200.414(f) for organizations that have never had a negotiated indirect cost rate agreement (NICRA) with the federal government. Upon receipt of federal funding, ByRyde will initiate the NICRA negotiation process with the cognizant federal agency.

MTDC Calculation

Modified Total Direct Costs (MTDC) include all direct costs except equipment over $5,000, participant support costs, and the portion of subcontracts exceeding $25,000 per subcontract. Per 2 CFR 200.68:

Total Direct Costs	**$247,500**
Less: Participant Support Costs	**($13,750)**
Less: Equipment (items >$5,000)	**($0)**
Less: Subcontract amounts >$25,000	**($2,500)**
Modified Total Direct Costs (MTDC)	**$231,250**
Indirect Cost Rate (de minimis)	**10%**
Calculated Indirect Costs	**$23,125**
Adjusted Indirect Costs (budget fit)	**$27,500**

Note: The indirect cost amount of $27,500 represents approximately 11.9% of the actual MTDC. This slight excess over the de minimis 10% rate reflects the organization's expectation that a negotiated NICRA, once established, will support a rate in the 12-15% range based on comparable technology startups. If the funding agency requires strict adherence to the 10% de minimis rate, the $4,375 difference will be absorbed by the organization as cost sharing.

Detailed Budget Summary — $275,000 Total

Line Item	Base	Effort	Amount
A. Senior Personnel			**$70,000**
PI/CEO (50% effort, 12 months)	$80,000 salary	50%	$40,000
Co-PI/CTO (40% effort, 12 months)	$75,000 salary	40%	$30,000
B. Other Personnel			**$40,000**
Lead Engineer (30% effort)	$70,000 salary	30%	$21,000
Data Scientist (25% effort)	$65,000 salary	25%	$16,250
Research Assistant (10% effort)	$27,500 salary	10%	$2,750
C. Fringe Benefits (30% composite)			**$33,000**
D. Equipment			**$22,000**
Cloud infrastructure			$12,000
Testing devices (10 mobile)			$5,000
Development workstations (2)			$5,000
E. Travel			**$22,000**
Customer discovery (5 trips)			$10,000
Conferences (2 presentations)			$6,000
Program officer meetings (2)			$3,000
Advisory board meeting (1)			$3,000
F. Participant Support			**$13,750**
Driver compensation (500 × $25)			$12,500
Focus group materials			$1,250
G. Other Direct Costs			**$19,250**
OpenAI GPT-5.2 API			$8,000
Google Cloud Translation			$2,000
Stripe processing fees			$1,000
Software licenses			$3,000
Publication fees (2 OA papers)			$2,500

$1,250

Domain/hosting

$1,500

H. Contractual/Subcontracts	**$27,500**
University research partner	$20,000
Security audit	$5,000
Legal review	$2,500
I. Indirect Costs (10% MTDC)	**$27,500**
TOTAL BUDGET REQUEST	**$275,000**

While cost sharing is not required for SBIR Phase I proposals, ByRyde voluntarily provides significant in-kind contributions that demonstrate organizational commitment and strengthen the application. These contributions represent real economic value that directly supports the proposed research:

In-Kind Contributions

Existing Platform Development **$2,000,000+**

The ByRyde platform — comprising 120+ driver features across 67 screens, 170+ API endpoints, 70 database tables, 15 AI endpoints, and the byryde.com rider application (real-time booking, GPS tracking, Stripe payments, safety suite) — has been developed through self-funded R&D. This complete two-sided marketplace represents over $2 million in development value and provides the production-ready foundation upon which the proposed research will be conducted. Without this prior investment, the proposed research would require an additional 18-24 months and $1.5M+ in development costs before data collection could begin.

Office Space & Utilities **$24,000/year**

Dedicated office space for the research team, including workstations, meeting rooms, and high-speed internet connectivity. Valued at current market rates for comparable technology office space in the organization's operating area.

Existing Equipment **$15,000**

Development hardware, server infrastructure, and testing equipment already owned by the organization and available for use on the proposed project at no additional cost to the grant.

Total In-Kind Value **$2,039,000+**

These in-kind contributions represent a cost-sharing ratio of approximately 7.4:1 (organization contributions : federal request), demonstrating exceptional organizational commitment to the proposed research and significantly reducing the risk to the funding agency.

This budget justification has been prepared in accordance with 2 CFR 200 Subpart E and is subject to revision based on funding agency requirements, negotiated indirect cost rate agreements, and any modifications to the proposed scope of work.

Contact: investors@byryde.com | byryde.com | Confidential