WEST LAFAYETTE
SMART CITY CHALLENGE

West Lafayette Smart City Challenge
Information Packet for Applicants

I. About the Challenge

The [Innovation Partners Institute](#) at the Purdue Research Foundation together with the [City of West Lafayette,](#) the [NineTwelve/Indiana 5G Zone](#), and [US Ignite](#) (collectively, referred to as "Challenge Committee") created the West Lafayette (WL) Smart City Challenge. The challenge seeks to empower innovative teams to "***develop a scalable IoT solution and/or software application[1]*** by leveraging the [City of WL's existing IoT infrastructure and data inputs](#) and the [Discovery Park District's NT5G Lab](#) to *improve safety for vulnerable road users* who navigate high-traffic corridors and intersections during major seasonal events."

II. Eligibility

The challenge invites applicants with the ability to pilot and evaluate the technology in the Discovery Park District Lab to Life Innovation Platform at Purdue University during the [challenge timeframe](#). Specifically, the challenge will invite applications from:

i) University-based student and/or faculty teams in the US, and

ii) US-owned and operated startups or businesses (< 25 employees).

III. Evaluation Criteria

Proposals will be evaluated by the Challenge Committee and experts from the Technology Advisory Board ([The Purdue Foundry](#), [NEXT Studios](#), [Ericsson](#), [Cisco](#), [Tilson](#), [AT&T](#), and [Miovision](#)) based on the following criteria:

- *[Impact](#)* – Does the solution address the challenge?
- **Viability** – How realistic and executable is the solution?
- **Scalability** – Is the solution scalable beyond the testbed demonstration?
- **Sustainability** – Is there broad-scale applicability supportive of commercialization?

IV. Challenge Structure & Timeline

The challenge is divided into three **phases**:

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- **Proposal** - Call for application with a goal to review at least ten proposals.
- **Prototype** - Up to three teams will advance to Phase II and earn a $5,000 stipend to develop a beta version of the proposed solution. The teams will also receive mentoring and coaching support from the Technology Advisory Board.
- **Pilot & Scale** - One winning team will get $10,000, an opportunity to pilot the solution for the City of WL, and receive support from the Purdue Foundry, NEXT Studios, and NT5G lab.

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[1] Includes data analytics, artificial intelligence, and machine learning.

V. Challenge Timeline

Phase I: Proposal	Phase II: Prototype	Phase III: Pilot
September 28, 2021 to December 3, 2021 (10 weeks)	**January 10, 2022 to April 22, 2022 (15 weeks)**	**May 2, 2022 to December 2022 (~ 33 weeks)**
Open to an unlimited number of applicants.	**Up to three teams** selected to participate, receives stipend 5K	**One team** selected to pilot, wins 10K.
Goal: Receive **at least ten applications**	Develops a Beta version of the product. Includes mentorship.	Opportunity to engage with Purdue Foundry and meet potential investors
Announcement of Winners: January 6, 2022	Demo Day: Week of April 25, 2022	Captures major seasonal travel events.
	Announcement of Winner: Week of April 25, 2022	

VI. Existing WL IoT Camera Infrastructure
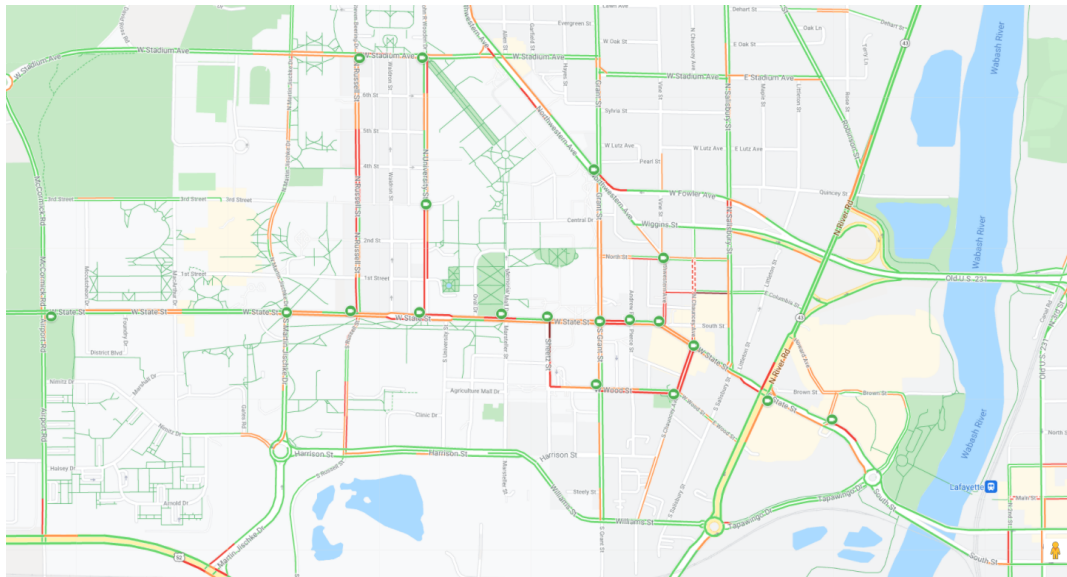
VII.   Application Questions

Applicant Profile

Submitter Name: _____
Proposal Lead (if not the same as Submitter): _____
Email: _____
State (drop-down list): _____
Zip Code: _____
Affiliation [University, Company, or Others]:_____

Please indicate your affiliation and provide the name of the organization you are affiliated with. For example, if your team is affiliated with a university respond: University - Indiana University

Team Name: _____
Solution or Product Name: _____

Proposal Description

I.   Executive Summary

Brief description of your proposed solution and how it will address the proposed problem statement. *[250 words or less]*

II.   Proposed Solution/Product

Provide a detailed description of your solution. Include specifics on technology and platforms you will use. [500 words or less]

III.   Supporting Documentation (optional)

You can upload video links, pictures, diagrams, etc., supporting documents should be referenced in the proposed solution or product description above.

IV.   Impact

How will your proposed solution enhance vulnerable road user safety? [150 words or less]

V.   Performance and Evaluation Metrics

How would you measure/quantify the impact of your proposed solution or product? Include details on the performance and evaluation metrics you will use to measure your proposed solution [250 words or less]

VI.   Key Project Milestones/Tasks (Table format)
List key activities for your project in a table format with three columns titled milestone, brief description, and timeline.

Milestone	Brief Description	Timeline

VII.   Use of Funds (budget) (Table Format)
Provide a breakdown of how you will use the $5,000 stipend if you proceed to Phase II. Please mention any additional resources/budget your team will procure for the project.

Item	Brief Description	Tentative Amount
X	XXX	$$
Total		

VIII.   Vision
What does success look like to you? (eg. continued use of solution/product beyond the challenge, expansion and broader utilization, sustain, commercialize) [250 words or less]

IX.   Additional Resources
Are there any additional resources such as requests for additional sensors, mentoring, or coaching support you will need from the challenge committee besides the funding? [250 words or less]

Team Description

X.   Your Team

Explain how your team is uniquely positioned to deliver results and why you are the best choice to solve this problem. Your response can include your team's previous performance or relevant experience that highlights your ability to deliver results. [250 words or less]

XI. List Key Team Members
Member #1:
First Name (5 word limit)
Last Name (5 word limit)
Affiliation (10 word limit)

Member #2:
First Name (5 word limit)
Last Name (5 word limit)
Affiliation (10 word limit)

VIII. How to Apply

Once you have collected responses to all the application questions, fill and submit this google form by December 3, 2021.

IX. FAQs

Click here for the most up-to-date FAQ list.

Definitions

A. How is road user safety defined?
Road user safety is defined as the prevention of bodily injury or fatality or property damage from multi-modal road traffic.

B. How does the city define vulnerable populations?
The city is interested in pedestrians, bicyclists, scooters, skaters, motorcyclists, etc. Basically, anyone not protected by 2500+ lbs of steel. However, the reduction of vehicle-to-vehicle collisions will also be considered as a secondary outcome.

Team Specific Questions

C. I am a faculty member, can I apply for the challenge?

Yes, faculty members are encouraged to apply for the challenge. They can team up with other faculty members or their students.

D. Is there a team size requirement?

There is no cap on the team size. Individual submissions are allowed.

Evaluation Metrics

E. What is a metric for how we can assess the impact (improvement in public safety)?

Police reports will contain the information that is needed including accidents, injury, injury severity, and other related traffic complaints. The current volume of incidents per year is about 5 -10. The Challenge Committee is evaluating various leading or intermediate indicators that could be used as proxy measures given the likely low frequency of reported incidents over the Challenge Timeline.

Data Type, Access & Ownership

F. What data and metadata will be made available to the teams?

Video files from WL Street cameras along State Street will be recorded and downloaded. The Challenge Committee is also exploring the ability to directly link to camera feeds via APIs. The videos contain consistent timestamps and location IDs. At some camera locations, the cameras are capable of "counts" of pedestrians and vehicles. The video files will be in MP4 format. The following data points can be made available to the teams in phase II:

- API (Raw data):
  - List of Active Alerts - This API polls the active/open intersection issues (flashing lights, detector issues, power loss, etc)
  - Intersection list - Polls location with lat/long coordinates. Should return 20 locations in this case.
  - Intersection Hiresdata - This is a configurable option depending on the traffic controllers. It allows access to centralized High res telemetry data that's recorded to 1/10th of a second.
  - TMC - Intersection Turning movement count including object classification (Car/single-unit truck, articulated truck, bus, bike, pedestrian). 24/7/365 turning movement count data.

- TMC by lane - In some configurations, there is an option to configure counts for each individual lane use. This could be used to determine lane volumes or lane utilization comparisons.
- TMC crosswalks - This API provides access to all the crosswalk counts (bi-directional pedestrian counts from each leg of the intersection)
- Travel time - Miovision devices include a Wifi travel time probe that can calculate the average travels between various points in the network.

- Compiled data: Congestion scan, Travel time, Approach volumes, Arrival on red, Green Allocation, Occupancy ratio, Pedestrian compliance, Pedestrian delay, Phase interval, Purdue coordination, Red Light Running (RLR), Simple delay, Split failure, Split trend, Report card, and Counts.
  📄 Traffic Insights Flashcards + Matrix (5).pdf : A flashcard set that includes data sources, definitions, and use cases of the Miovision data in our platform.

NOTE: Only teams that are selected for Phase 2 will have access to this data set subject to permission from city and platform access.

In addition, the NT5G is able to provide data and cloud access for the teams and support the deployment of additional IoT devices and sensors along State Street should additional or supplemental information be desired by the Project Teams.

G. Who owns the data?

Data captured and used as part of the smart city challenge will be licensed to the Project Teams for the purpose of supporting their Challenge activities. At no time will data ownership be transferred to the project teams. At the conclusion of the Challenge, the data license will terminate and all data in possession of the project teams will need to be returned or destroyed.

H. How many cameras will be included and what are their locations?

The city has 19 cameras. They can all be made available, but the focus of the pilot activity will be along State Street.

X. Support

In addition to the stipend, the Phase II winning teams will also have access to mentoring and coaching support from the Technology Advisory board. The nature of support will be tailored to each team's needs to develop a successful prototype. NT5G lab, located at 101 Foundry

Drive, West Lafayette, Indiana, will provide access to our facility to assist in test and development in a lab controlled environment. NT5G can also provide insight and assist in technical questions pertaining to network connectivity and IoT sensor integration.

XI.   Contact us for Additional Questions

If you have any questions or require any special accommodation(s) please feel free to reach out to us at challenges@us-ignite.org. You can also request a 20-minute call by filling out this form.