2015年10月14日発行速報版

ITS世界会議ボルドー2015参加報告

自動運転を中心とした報告

2015年10月14日

特定非営利活動法人 ITS Japan

自動運転プロジェクト　内村孝彦

ITS世界会議ボルドー2015報告目次

今回の会議で捉えた欧米動向の変化を中心に本報告をまとめた

- ◆ 概要報告 --- P3
- ◆ ITS世界会議ボルドー2015セッション --- P4
- ◆ ITS世界会議ボルドー2013試乗デモ --- P5～13
- ◆ ITFVHA会議 --- P14～17
- ◆ 米国動向アップデート：概要動向 --- P18～23
- ◆ USDOT CV Pilot Program --- P24～53
- ◆ 米国：州の取り組み　フロリダ州 --- P54～59
- ◆ 欧州動向アップデート：FP7～H2020 --- P60～62
- ◆ 欧州各国プロジェクト --- P63～64
- ◆ 欧州：FP7プロジェクト進捗状況 --- P65～74

自動運転に関する概要

- 自動運転への関心、取り組みの拡大が続いている
- 自動運転でのConnectedの重要性が各所で聞かれた
- 新たなプロジェクトへの展開が継続している
  - 欧州
    - ✓ Horizon 2020に向けた取り組みが進行
    - ✓ 各国プロジェクトの展開が拡大
    - ✓ Horizon2020,Twinning等の外部パートナーの参加募集
  - 米国
    - ✓ CVパイロットプロジェクトのWave1がNYC、タンパ、ワイオミングで開始
    - ✓ 州による取り組みが拡大
- 自動運転のドメインは以下に分類される
  - 乗用車
  - トラック隊列走行
  - 都市用共有モビリティ
- トラック隊列走行は、議論、プロジェクトが多く、早期実現の可能性を感じる

ITS世界会議ボルドー セッション構成

- セッション
  - Prenaly:3件
  - 全セッション271件
  - 自動運転関連39件、協調型ITS関連59件
  - 同時間帯に同テーマセッションが設定され参加セッション選定に難あり
  - 同様の発表内容で別セッションでの発表が散見された

下記青色が自動運転、協調型ITSセッション

ITS世界会議ボルドー 試乗デモ

■ **試乗会全36件**：試乗会は不参加のためプログラムからの引用
- ➢ 9件自動運転
- ➢ 9件協調型ITS

AISIN Group: Remote Parking and Driver Monitoring System for Automated Driving

Attendees must register through the demonstrations registration portal or on site at the Demonstration Lounge.

LOCATION: Parking M

SCHEDULE: Tuesday 6 to Thursday 8 October: 9:30 – 18:00 (1 departure every 30 minutes)
Friday 9 October: 9:30 – 12:30 (1 departure every 30 minutes)

The technology of automated driving has been developing all over the world. AISIN Group will contribute to the practical use of automated driving by driver sensing technology and navigation system technology (room: Amphi C) on Wednesday 7 October from 13:00 to 18:00.

Driver Monitoring System keeps watch over the state of a driver, to automatically stop the vehicle safely in the case of emergency. In terms of technology of Navigation system, you can see real time map renewal. And as low-speed automated driving, you can experience unattended remote control parking.

ITS世界会議ボルドー 試乗デモ

AKKA: Link In City, Technology Demonstrator – Intelligent Transport Systems

Attendees must register through the demonstrations registration portal or on site at the Demonstration Lounge.

LOCATION: Parking M

SCHEDULE: Tuesday 6 to Thursday 8 October: 10:00 – 10:45, 11:15 – 12:00, 13:30 – 14:15, 15:45 – 16:30
Friday 9 October: 10:00 – 10:45, 11:15 – 12:00

Urban, social and geared user experience: Link In City is a concept using Link&Go as an autonomous driving platform for merging transport and IT connected technologies.

The project is innovative through a new integration of data given by the "smart city" in terms of infrastructure, tridimensional modelling, public and private services, and also by enabling an improvement of autonomous driving and an enrichment of the user experience of the passengers.

- The integration of a GNSS sensor allowing an improvement of driving algorithms by giving a tridimensional view of the city of Bordeaux (LIDARS sensors and stereoscopic camera).
- Interpretation of where the car is in order to question the web services of the smart cities (open data and application) to deliver on-board services
- Use of the Big Data platform in a determining Cloud environment:
  - 4 ways of using a trip: family/hobbies; work; tourism; public action.
  - The development of web-crawling algorithms and semantic research.
  - The display from the social networks of multimedia contents determined according to the profile of the user and the selected process (social networks).

ITS世界会議ボルドー 試乗デモ

EASYMILE: CityMobil 2

Registration is not required.

LOCATION: Berges de Lac

SCHEDULE: Tuesday 6 to Thursday 8 October: 9:15 – 18:00
Friday 9 October: 9:15 – 14:00

The Ligier Group and Robosoft Technology companies are associated in the form of a joint venture to create the EasyMile company. EasyMile provides the electric vehicles EZ10, its designated software (embedded and non embedded) as well as support to its network of customers in France and abroad.

The EZ10 is an electric driver-less vehicle that can carry up to 12 people (6 seating positions and 6 standing positions or a wheelchair thanks to its access ramp). It moves autonomously combining a hybrid of 3 different localization technologies: a GPS tracking system, a visual guidance, and the SLAM technology.

It is designed to cover short and predifined routes, requiring very light infrastructure. Potential applications are numerous : pedestrian city centers, gentle mobility areas, pedestrian tunels, inter-modal areas to link seft-service bike rental and car-sharing stations, airports, amusement parks, parking spaces, hospitals, universities, or even industrial sites.

As part of CityMobile2 project, EasyMile will provide a fleet of 4 vehicles to carry people from the Palais des Congrès to the Hall des expositions.

ITS世界会議ボルドー 試乗デモ

Groupe Renault: Autonomous Valet Service by Renault

Attendees must register through the demonstrations registration portal or on site at the Demonstration Lounge.

LOCATION: Central area

SCHEDULE: Tuesday 6 to Thursday 8 October: 9:30 – 10:30, 11:00 – 12:00, 14:30 – 15:30, 16:00 – 17:00
Friday 9 October: 9:30 – 10:30, 11:00 – 12:00

A highly automated valet vehicle service will be demonstrated using Renault's electric vehicles. The service is for use as part of vehicle fleets like Taxi pools. The user shall be able to reserve a car from the vehicle pool through an Internet/Intranet application either from his desk or a mobile device. For this purpose, he will enter a time and point of departure. When the time arrives, a text message telling that the car is waiting at the specified meeting point will be sent to the user. The car shall have the necessary electrical power according to the travel needs. The user "checks in" using an RFID card on the sensor on the vehicle windscreen. Access is then given to the user, with the car switching from autonomous to manual mode to let the user take over. Once, the trip is over the car is left at the location of choice, it will return driverless to the taxi pool.

The demonstration is based on a Fluence Z.E., Renault electric vehicle, which has been automated using only close to production automotive components, it leverages on wireless connectivity to implement the service and for monitoring purposes.

ITS世界会議ボルドー 試乗デモ

Ibeo Automotive Systems: Assist with Active Breaking and Automatic Scenario Generation by Reference Sensing

Attendees must register through the demonstrations registration portal or on site at the Demonstration Lounge.

LOCATION: Parking M

SCHEDULE: Tuesday 6 to Thursday 8 October: 9:15 – 18:00 (1 departure every 20 minutes)
Friday 9 October: 9:15 – 12:00 (1 departure every 20 minutes)

Part 1: The visitor drives the demo vehicle. While turning a pedestrian (dummy) crosses the street. If the collision is almost unavoidable, an Automatic Emergency Braking (AEB) action is triggered. If the driver reacts appropriately to avoid the collision, the AEB system will not be activated.

Part 2: After the drive is completed, and while the test vehicle is driven back to the starting point, a reference scenario is automatically computed by the Ibeo Evaluation Suite software, using the data that has been sensed during the drive. The reference scenario contains relevant information including events (e.g. point of no return and start of braking) and the behaviour of all road users over time (e.g. trajectories and motion).

Part 3: When leaving the vehicle, the visitor receives a one page printout and an access card to Ibeo's online platform. Using this platform the visitors are able to download a viewer and the scenarios produced during the live demonstration.

ITS世界会議ボルドー 試乗デモ

NAVYA: New Driverless Vehicle NEO

Registration is not required.

LOCATION: Near Hall 1

SCHEDULE: Tuesday 6 to Thursday 8 October: 9:15 – 18:00
Friday 9 October: 9:15 – 14:00

NAVYA provides 100% Autonomous and Electric transport solutions based on fleets of shuttles for the "first and last kilometer". The applications of the NAVYA solutions are closed-circuit areas: airports, industrial sites, nuclear plants, theme parks, business centers and many others. On these sites, the self-driving shuttles can carry customers and staff without any infrastructure. NAVYA is releasing its new shuttle at the Congress and putting it at your disposal for a try.

The NAVYA Demonstration at ITS is on open-road and links the Parc des Expositions and the Palais des Congrès as detailled in the attached map. To take part to the demonstration and experience this World Premiere for the NAVYA Shuttles, visit the NAVYA team at the Demo Lounge or at the NAVYA Stand B158.

Specifications of the new vehicle

The NAVYA shuttle is a four-wheel drive, electrically re-chargeable, with a capacity of 15 people, capable of independent operation along defined and approved automated shuttle routes. The new vehicle has a 360° field of vision and considers of all the static and dynamic obstacles. According to this environment, the new NAVYA adapts the most relevant speed thanks to Multisensor Technologies: GPS, Lidar, Radar and video camera.

The advantages

The NAVYA solutions are operating without any infrastructure. Once the path is programmed the shuttle reproduces it in a smart way: obstacle detection and obstacle avoidance. The fact that the path is programmed allows large flexibility: the circuit can be changed easily and quickly. In the end, the NAVYA solutions allow productivity gains, money saving and environment improvement. On-site travels become pleasant, easier and faster.

Demonstration MAP

ITS世界会議ボルドー 試乗デモ

UTBM: X icars

Attendees must register through the demonstrations registration portal or on site at the Demonstration Lounge.

LOCATION: Central area

SCHEDULE: Tuesday 6 to Thursday 8 October: 9:15 – 9:45, 11:15 – 11:45, 15:00 – 15:30, 17:05 – 17:35
Friday 9 October: 9:15 – 9:45, 11:15 – 11:45

UTBM and FAAR Industry are pleased to present you a unique experience in early beginning of French PRT (personal rapid transit) network.

Traffic congestion is one of the major problems of this century. Today, infrastructure managers as well as public authorities support the huge effort to alleviate the traffic. Tomorrow, your personal vehicle will contribute to improve the way of sharing the infrastructure.

Indeed, the automotive industry has promised to introduce the autonomous vehicle very soon. Moreover, vehicles will be able to know accurately their position and to communicate with their surrounding environment (up to IEEE 802.11p). Vehicles will negotiate together the access to conflicting spaces.

According to the real observed situation, they will smartly decide together which vehicle will cross the intersection first which will be the next and so on. Such a "sequence formation" will contribute, without doubt, to prevent traffic deadlock (gridlock) and consequently to increase the capacity of our road network. Furthermore, the vehicles will accordingly synchronize their speeds together.

The demonstration, titled "X icars", managed and designed by UTBM – Université de Technologie de Belfort-Montbéliard and FAAR Industry, French company – expert in autonomous driving control electronics and funded by "Conseil Régional de Franche-Comté", allows you to dive into the future.

Three vehicles, equipped by FAAR Industry, expert in autonomous driving control electronics, run on an eight-shaped circuit. Neither traffic lights nor stop signs will be used. The vehicles approaching the intersection will be informed about the possible conflicting situation, exchange information and find together a solution through a roadside unit. Hence, all vehicles will keep safe distances not only with the precedent vehicle in the same lane but also with vehicles coming from the conflicting lane.

We hope you will fully enjoy the live demonstration and booths of our team (UTBM, FAAR Industry, Voxelia and Car2Road), in which you will discover the futuristic user interface developed by FAAR Industry and its partners as well as the mixed reality tool in which virtual vehicles interact with real ones.

The tool, developed by Voxelia, highlights the raised feasibility issues according to the accuracy of the positioning systems, by comparing GPS, EGNOS and RTK.

ITS世界会議ボルドー 試乗デモ

Valeo Cruise4U: Highly Automated Driving on Open Roads

Attendees must register through the demonstrations registration portal or on site at the Demonstration Lounge.

LOCATION: Parking M

SCHEDULE: Tuesday 6 to Thursday 8 October: 9:15 – 15:45 (1 departure every 30 minutes)
Friday 9 October: 9:15 – 13:45 (1 departure every 30 minutes)

With Valeo, experience highly automated driving, in real traffic conditions, on the open roads of Bordeaux, France. At the ITS World Congress, Valeo gives you the opportunity to experience highly automated driving by taking a ride in our Valeo Cruise4U car. For about 20 minutes, you will ride hands-off as the Valeo Cruise4U car drives around the Bordeaux Exhibition Center on highway A630.

Does automated driving intrigue you? Come and visit Valeo at the ITS World Congress to learn more and test the future of autonomous driving.

Valeo is one of the world's leading automotive suppliers. As a technology company, we offer innovative products and systems contributing to CO2 emissions reduction and the development of intuitive driving.

Autonomous vehicles are the focus for innovation within the automotive industry. Valeo is a key player in automated driving; offering you the opportunity to discover highly automated driving with our Valeo Cruise4U demonstration. Thanks to the combination of sensor technologies, including the unique Valeo SCALA laser scanner integrated with the market-proven camera from Mobileye, Valeo will lead you to the future of autonomous driving.

The Valeo SCALA is a unique laser scanner that precisely scans the front of the vehicle, in day or night time conditions, during fast or slow driving. Valeo SCALA can detect any kind of obstacle, making autonomous driving possible.

ITS世界会議ボルドー 試乗デモ

VEDECOM: Autonomous Driving

Attendees must register through the demonstrations registration portal or on site at the Demonstration Lounge.

LOCATION: Parking M

SCHEDULE: Tuesday 6 to Thursday 8 October: 9:15 – 18:00 (1 departure every 30 minutes)
Friday 9 October: 9:15 – 12:30 (1 departure every 30 minutes)

Imagine what you could do if your car was able to drive for you… With the VEDECOM prototype, you can test fully autonomous driving across a 7km route in real traffic conditions at the Bordeaux Exhibition Centre.

The **VEDECOM Institute** is one of the **Institutes for the Energy Transition** created wiithin the 'Plan d'Investissement d'Avenir' (investment plan for the future) of the French government. VEDECOM stands for "Véhicule Décarboné Communicant et sa Mobilité" in French, which means carbon-free, communicating vehicle and its mobility. It is supported by the French competitiveness cluster Mov'eo and by several local communities (the Versailles-Grand-Parc and St-Quentin-en-Yvelines urban communities, and the General Council of Yvelines).

The objective of VEDECOM is to become an institute for mutual and co-located research on electric, autonomous and connected vehicles, and on the mobility eco-system built on infrastructures and services addressing new usages of shared mobility and energy.

VEDECOM comprises more than 40 members of different industry and service sectors (automotive, aeronautics, system engineering, electronic components, ITC, numerical simulation, infrastructure management, transport operators, digital and energy grid operators), of several research and higher education institutions, and of local communities. All of them accepted to collaborate on pre-competitive and pre-normative research subjects. Such research implies a multidisciplinary effort associating physicists and chemists, mechanical, electrical and electronics engineers, computer scientists, to study the new technologies. But it also involves sociologists, psychologists, economists and lawyers to study the new usages, and the impacts and acceptability of new technologies in order to promote suitable ergonomic and regulatory frameworks.

ITFVHA会議2015より

出典：ITFVHA会議BISHOPコンサルティング他

ITFVHA　第19回 年度会議

■ ITFVHAとはどういう会議か?

(INTERNATIONAL TASK FORCE ON VEHICLE-HIGHWAY AUTOMATION)

- 高度運転支援システムの開発と展開に対する官民の役割を議論する場
- 情報の交換とグローバル連携を強化するための非公式グループによる会議

■ 参加者

- 世界中の自動運転に関係する専門家約100名(日本からは約10名参加)

■ 過去の歴史

Organizational meeting: 1996, Orlando

1997, San Diego
1998, Delft, Netherlands
1999, Toronto
2000, Tsukuba City
2001, Sydney
2002, Chicago
2003, Paris
2004, Nagoya
2005, San Francisco
2006, London
2007, Versailles
2008, New York City
2009, Stockholm
2010, Busan
2011, Orlando
2012, Vienna
2013, Tokyo
2014, Detroit
2015, Bordeaux

ITFVHA関心事の議論

1.　2014年の最も大きな開発成果は何か?

1. 立法者と規制者:法律の改定や公道試験の解除等
2. Googleの進化
3. 新規参入者
4. 技術の進化
5. ニュースやメディア
6. プレスイベントやデモ
7. トラック自動化の進化
8. 進展のスピード
9. 市場の拡大:AEB等の採用拡大
10. デジタルインフラの作成
11. CityMobil2の進化
12. 試験場の拡大:Mcity, GoMentum等

ITFVHA関心事の議論

2. 今後3年で対処すべき重要な課題は?(各自2点を回答)

1. 法律、規制のフレームワーク
2. 評価とテスト
3. Human Factors
4. 技術
5. Cybersecurity
6. 既存システムとの共用性
7. 公共の受容性
8. その他の課題
    1. インフラの支援
    2. 産業の再構築
    3. 研究開発費の確保
    4. システムの倫理問題
    5. ビジネスモデル
    6. 自動運転に向けたビジョンの構築
    7. 保険
    8. 東京オリンピック

米国動向アップデート

動向概況:ネット情報等により補足

米国の動向概況

■ USDOT Connected Automationの進捗状況

Autonomous Vehicle

Automation Research Truck
州によるプロジェクト
- Mcity
- GoMentum Station
- 他州に拡大

Strategic plan 2015–2019
- Realizing CV Implementation
- Advance Automation

Connected Automated Vehicle

Beyond Traffic 2045 TRENDS AND CHOICES

FHWAインフラガイドライン→AASHTO

Connected Vehicle

CV Pilot Program：＄42mプロジェクト
- NYC, Tampa, Wyoming

USDOTの自動運転に関する研究

■ 5つの領域の課題

Enabling Technologies 実現技術		
Digital Infrastructure	Communications	Technology Research

Safety Assurance 安全の保障			
Electronic Control Systems	Functional Safety and Electronics Reliability	Cybersecurity	Human Factors

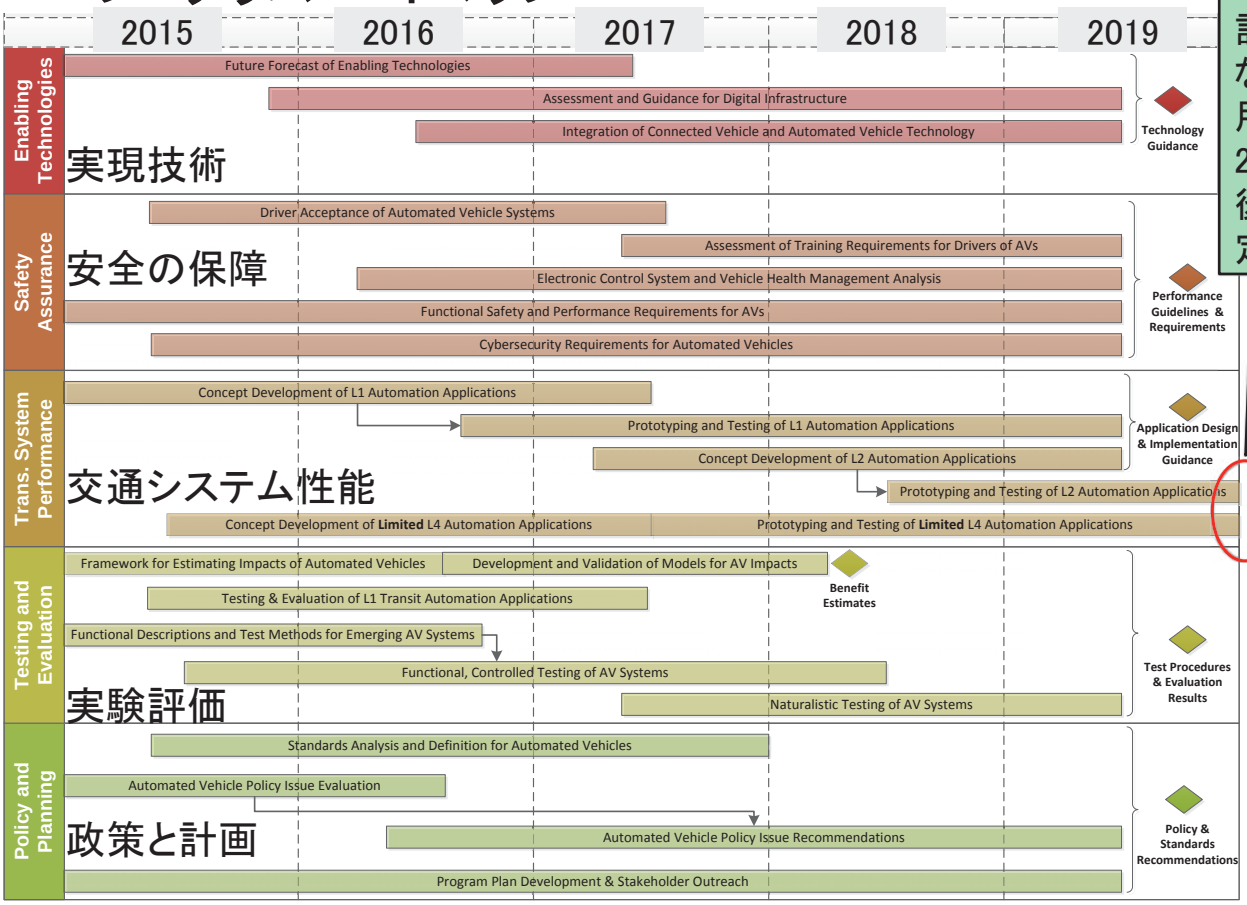
Transportation System Performance 交通システム性能		
CACC, Speed Harmonization, and Platooning	Lateral Control	First/Last Mile and Transit Operations

Testing and Evaluation 実験評価		
Interoperability	Testing Methods	Benefits Assessment

Policy and Planning 政策と計画			
Standards	Federal Policy Analysis	Stakeholder Engagement	Transportation Planning

USDOTの自動運転に関する研究

■ プログラムロードマップ



時期が明記されていないが実用化は2020年代後半と想定

技術とポリシーの課題

- ■ 利用者の期待
- ■ Human factors
- ■ インフラと土地利用
- ■ Cybersecurity
- ■ テストと認証
- ■ データの所有とプライバシー
- ■ 州と地域の法律の調和

AV ポリシーリサーチロードマップ

■ 課題と取組時期

		短期				長期		
法律環境	連邦政府の標準と規制の適用	＋	＋	＋				
	安全基準や認証手順の作成	＋	＋	＋				
	ITSとAVに関する立法精査と分析	＋	＋	＋				
	FMCSA規制と執行に対するAVのインパクト調査	＋	＋	＋				
データプライバシーとマネジメント	交通データ収集と運営に対する影響	＋	＋	＋				
	プライバシー、ポリシーと運営の評価	＋	＋	＋				
責任問題	責任と保険モデル	＋	＋	＋				
利用者と社会的課題	顧客受容性と教育		＋	＋	＋			
	社会的影響とポリシーの明確化			＋	＋	＋		
インフラと計画	インフラ計画と投資			＋	＋	＋		
	長期交通計画手順への影響				＋	＋	＋	
	土地利用とポリシー					＋	＋	＋

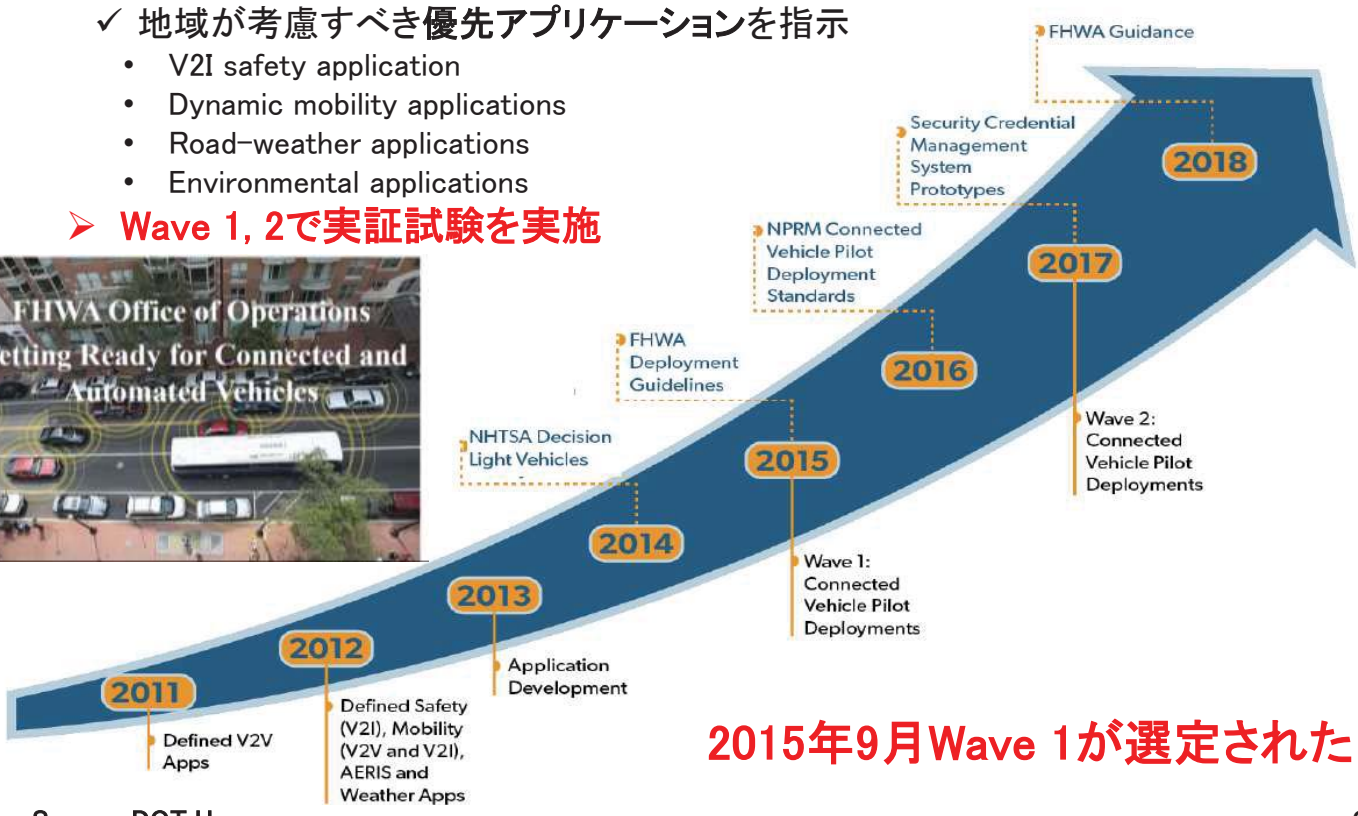
USDOT Connected Vehicle Pilot Deployment Program

USDOT HP情報等より

CVパイロット展開プロジェクト

■ロードマップ

- ➢ FHWAのガイダンスがサポート
  - ✓ 地域が考慮すべき**優先アプリケーション**を指示
    - V2I safety application
    - Dynamic mobility applications
    - Road-weather applications
    - Environmental applications
- ➢ **Wave 1, 2で実証試験を実施**



2015年9月Wave 1が選定された

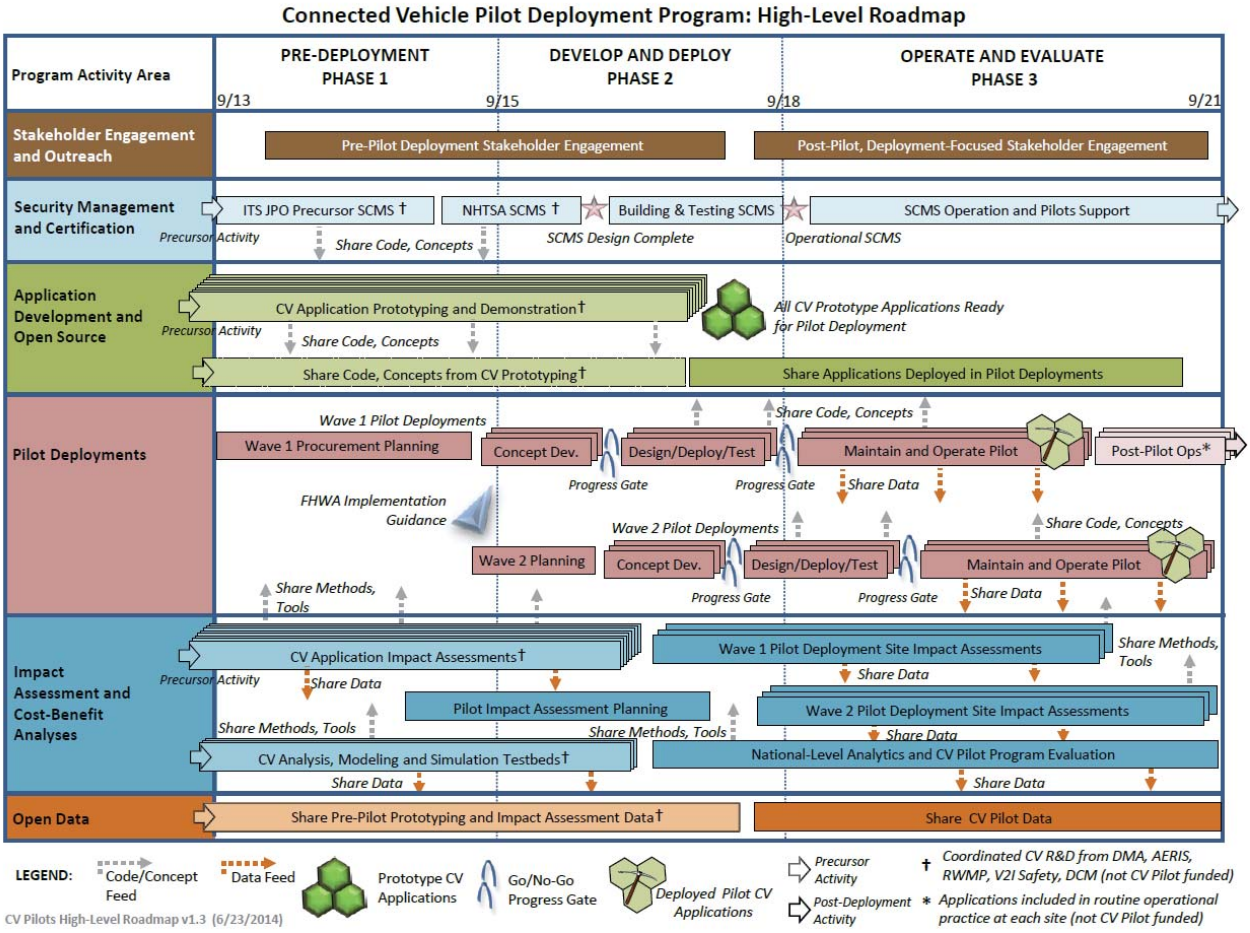
Source：DOT Homepage

CVパイロットプログラムのゴール

■ 早期展開を目指したローカルプログラムを実施

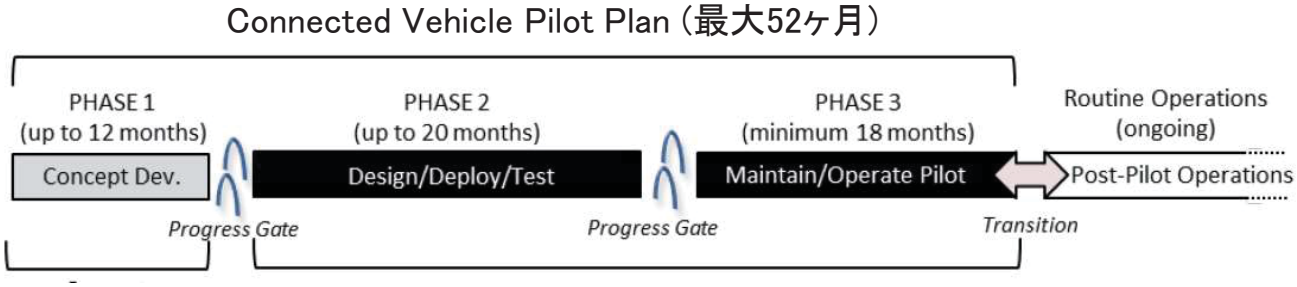
U.S. Department of Transportation 9

全体開発ロードマップ



プログラムスケジュール　Wave 1　Phase 1-3

- **Phase 1: コンセプトの開発**
  - Progress Gate：コンセプトは展開できる状況にあるか?
- **Phase 2: 設計/展開/テスト**
  - Progress Gate：システムは計画通り機能するか
- **Phase 3: 維持/運用**
- **パイロットオペレーション以降**
  - CV技術の運営実践への統合



現在の募集　　合意内容に準拠

2015年9月NYC、タンパ、ワイオミング州が選定された

運営体制

■ DOTでの運営体制

DRAFT

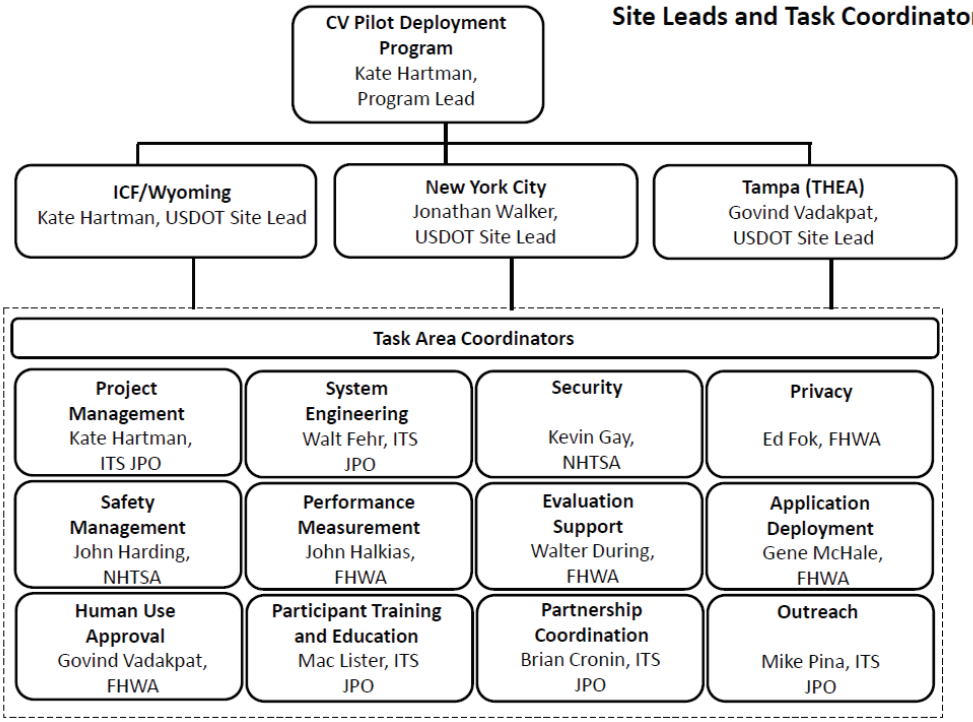
CV Pilot Deployment Program
Federal Team Organization

Site Leads and Task Coordinators

THE PROGRAM LEAD directs the program in all its activities.

SITE LEADS guide Wave 1 sites to be successful in Phase 1.

TASK COORDINATORS work with Site Leads to coordinate across sites regarding key topics of interest.



評価体制

■ DOTでの評価体制

DRAFT

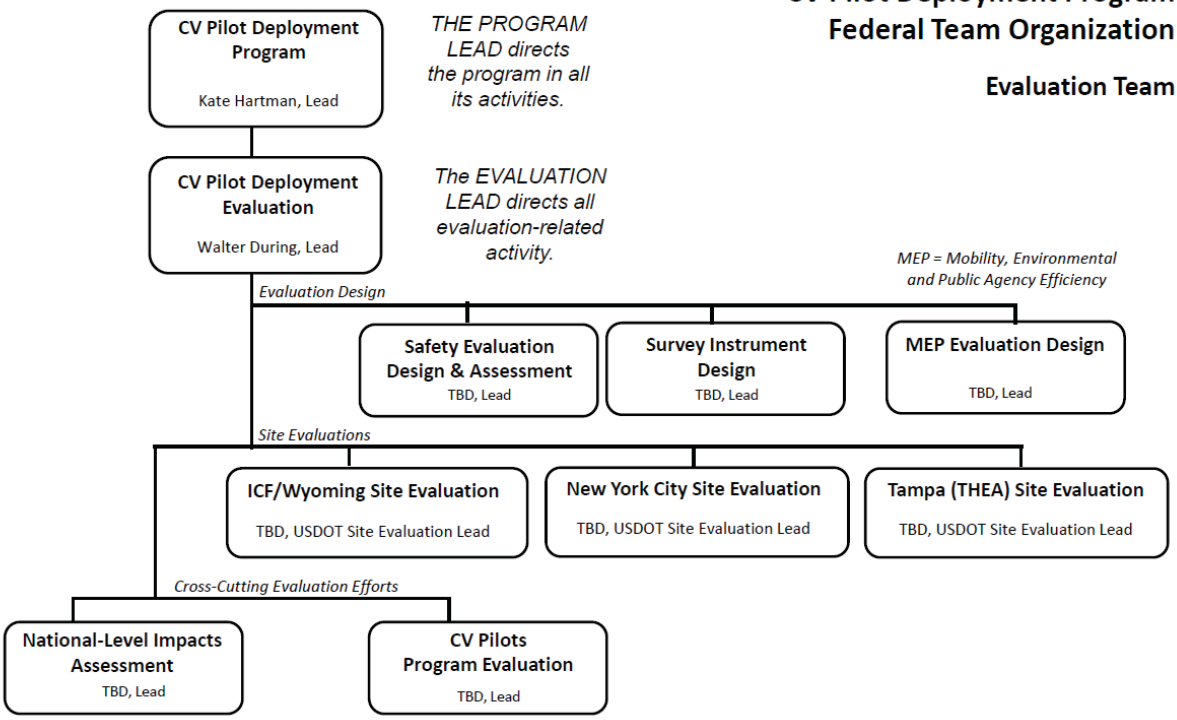
CV Pilot Deployment Program
Federal Team Organization

Evaluation Team

THE PROGRAM LEAD directs the program in all its activities.

The EVALUATION LEAD directs all evaluation-related activity.

MEP = Mobility, Environmental and Public Agency Efficiency

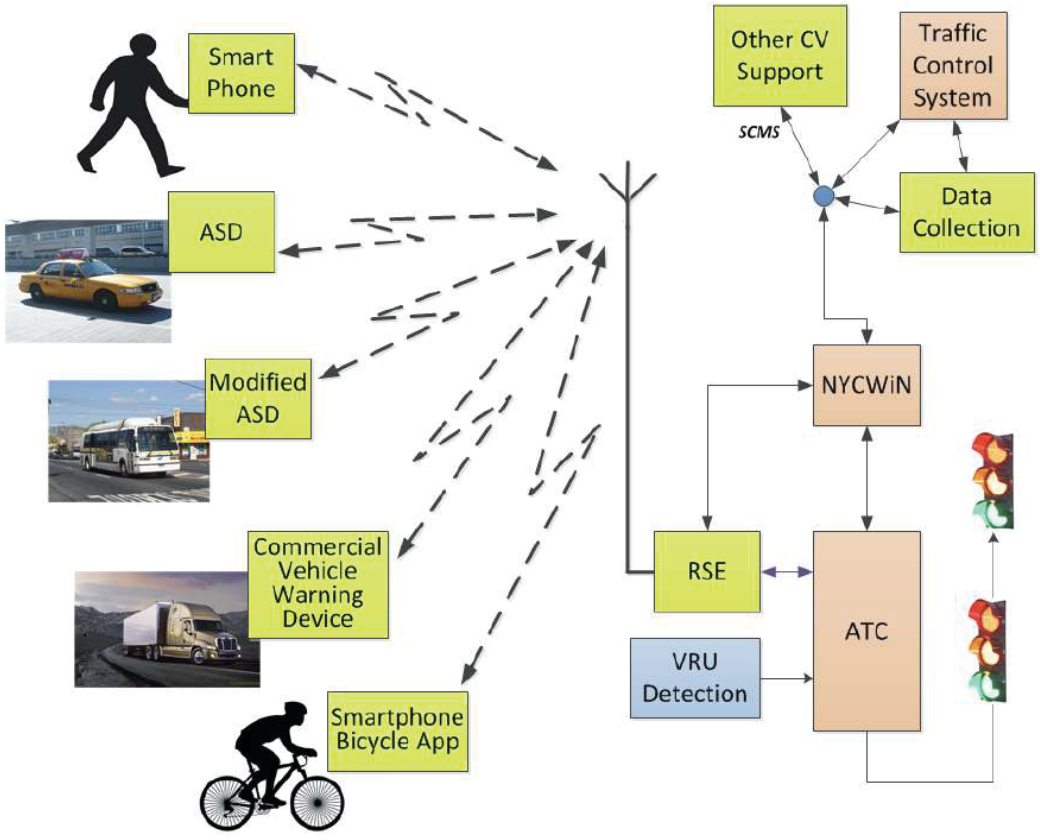


各地域の提案：NYC・New York州

■ NYCからの提案：2015年9月30日

各地域の提案： NYC・ New York州

■ NYCのConnected Vehicle Pilotのビジョン：ビジョンゼロ



各地域の提案: NYC・ New York州

■ Pilot Deployment地区概要:3地域

- ➢ Manhattan Grid
- ➢ Manhattan FDR Dr.
- ➢ Brooklyn Flatbush Ave

- Grid (600' x 250')
- Day vs. Night conditions
- Residential/commercial mix
- High accident rate arterials (2012-2014)
  - 20 fatalities
  - 5,007 injuries
- 204 intersections

Manhattan Grid

Manhattan FDR Dr.

- Limited access highway
- Excludes trucks/buses
- Short radius curves
- Over-Height restrictions
- $1,958,497 in Over-Height incident delay costs (2014)
  - 24 % of City-wide total

Brooklyn Flatbush Ave

- Over-Height restrictions
  - Tillary St.
  - Brooklyn Bridge
- High accident rate arterial 2012-14 (red dots)
  - 1,128 injuries
  - 8 fatalities
- Average speed 15 mph (AM inbound)
- 35 intersections

各地域の提案: NYC・ New York州

■ モビリティと安全の課題

- ➢ 商用トラックの事故
- ➢ 歩行者の受傷

■ 具体的課題

1. 速度違反の削減
2. 事故多発交差点での事故防止
3. 歩行者安全の向上とバス交通混雑領域でのバス関連事故の削減
4. 障害歩行者の安全性向上(V2P)
5. トラック安全性向上
6. 橋の低クリアランス問題の改善
7. トラックルート規制の強化
8. 工事地区安全の向上
9. 超混雑エリヤでのモビリティのバランス
10. 衝突、傷害、遅れの削減

各地域の提案：NYC・New York州

■ CVのアプリケーション候補と評価指標案

	NYCのニーズ	アプリケーション案	評価指標案
1	速度違反の削減	エコスピードハーモニゼーション	• 平均停止数 • 平均速度 • 平均排気 • 急加減速数
2	事故多発交差点での事故防止	信号無視警報	• 信号無視の削減 • 交差点事故の削減
3	歩行者安全の向上とバス交通混雑領域でのバス関連事故の削減	歩行者存在警告	• バスと歩行者事故の削減 • 警告発信数
		バス前右折警告	• 警告発信数
4	障害歩行者の安全性向上(V2P)	モバイル利用型歩行者信号システム	• 交差点での待ち時間 • 歩行者違法横断の削減
5	トラック安全性向上	カーブスピード警告	• ランプでの事故削減 • 警告発信数

各地域の提案：NYC・New York州

■ CVのアプリケーション候補と評価指標案

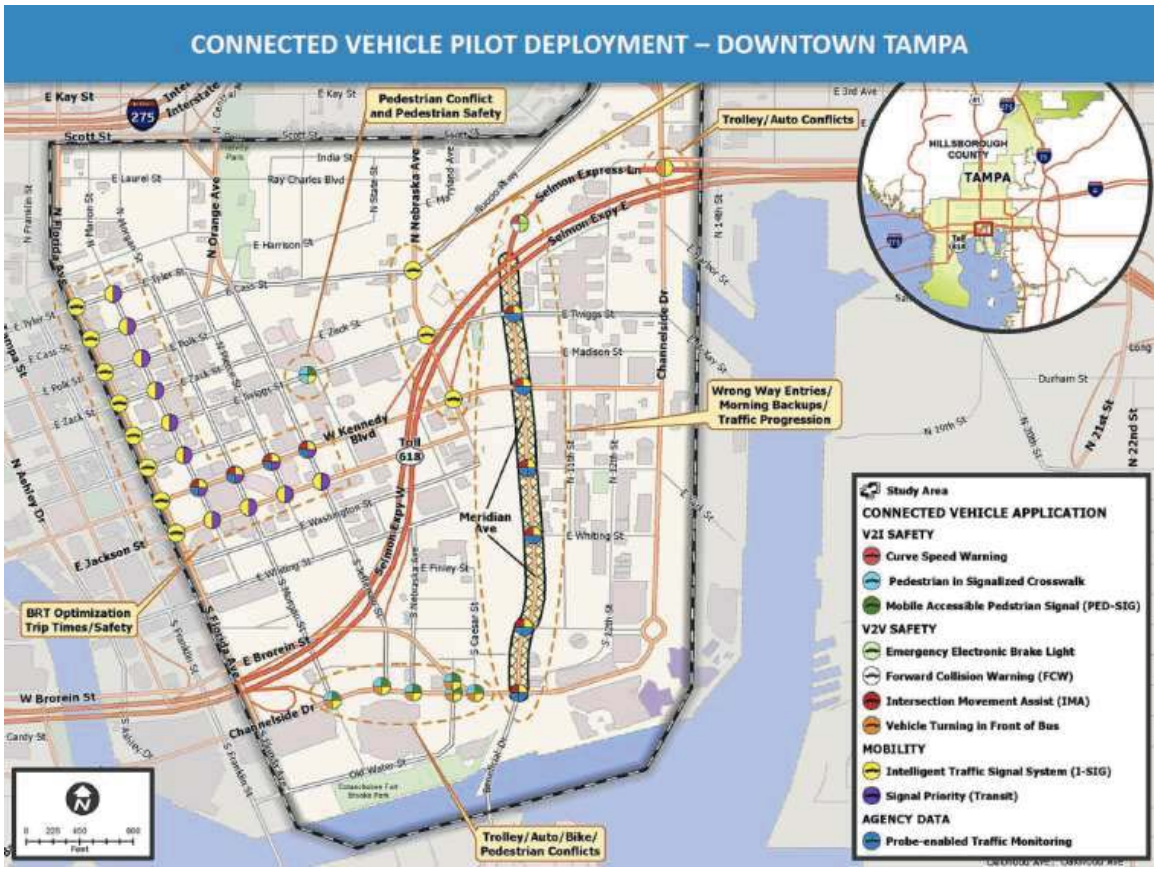
	NYCのニーズ	アプリケーション案	評価指標案
6	橋の低クリアランス問題の改善	輸送ダイナミック運行計画	• 警告発信数
7	トラックルート規制の強化	輸送ダイナミック運行計画	• トラック経路違反数削減 • 警告の発信数
8	工事地区安全の向上	速度低減/作業領域警告	• 速度の低減量
9	超混雑エリヤでのモビリティのバランス	インテリジェント交通信号システム	• 平均速度 • 平均停車時間 • 平均旅行時間 • 交差点での処理能力 • 急加減速数
10～15	衝突、傷害、遅れの削減	V2V　安全アプリケーション	• 衝突 • 傷害 • 物損コスト • アプリ有り無しの比較
16	避難と通常時警告	車両情報	• 受容性と運転者インタビュー

各地域の提案：Tampa・フロリダ州

■ フロリダ州タンパの提案

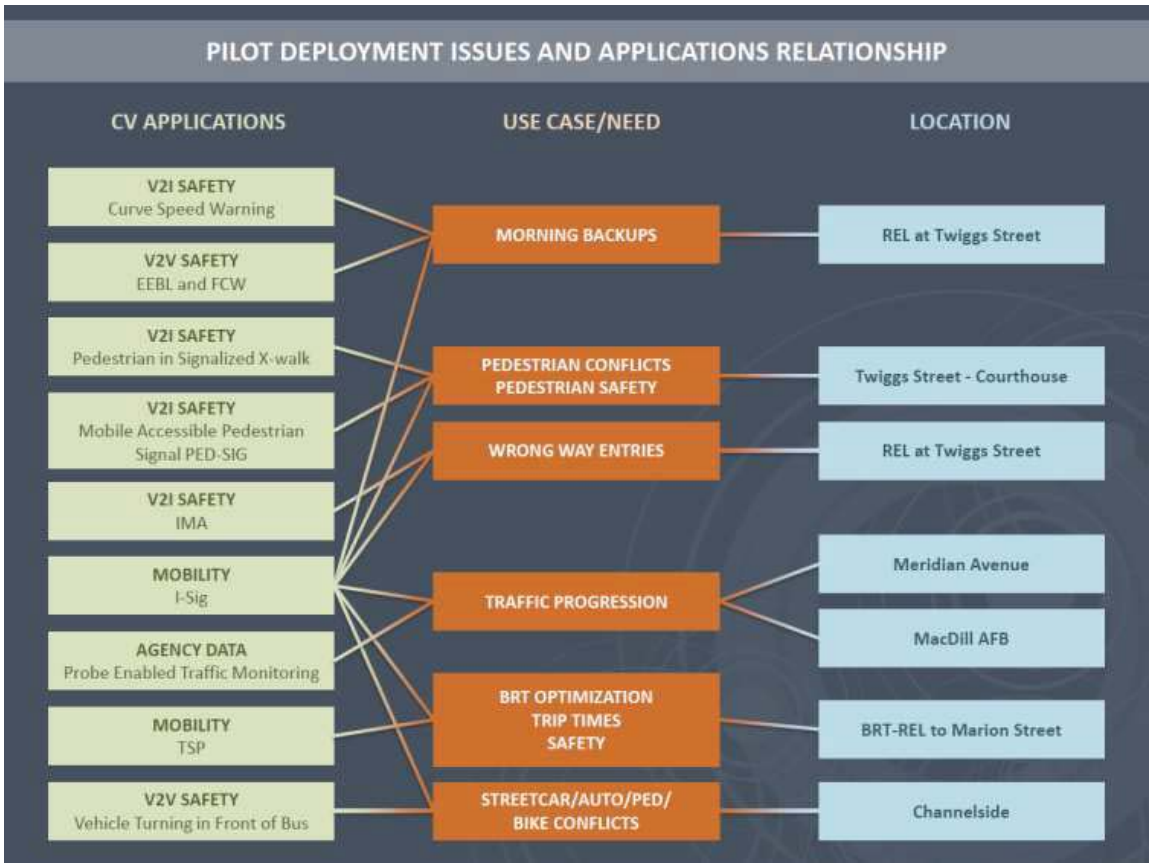
各地域の提案：Tampa・フロリダ州

■ ダウンタウンタンパ地区の展開地区



各地域の提案：Tampa・フロリダ州

■ 課題とアプリケーションの関連



各地域の提案：Tampa・フロリダ州

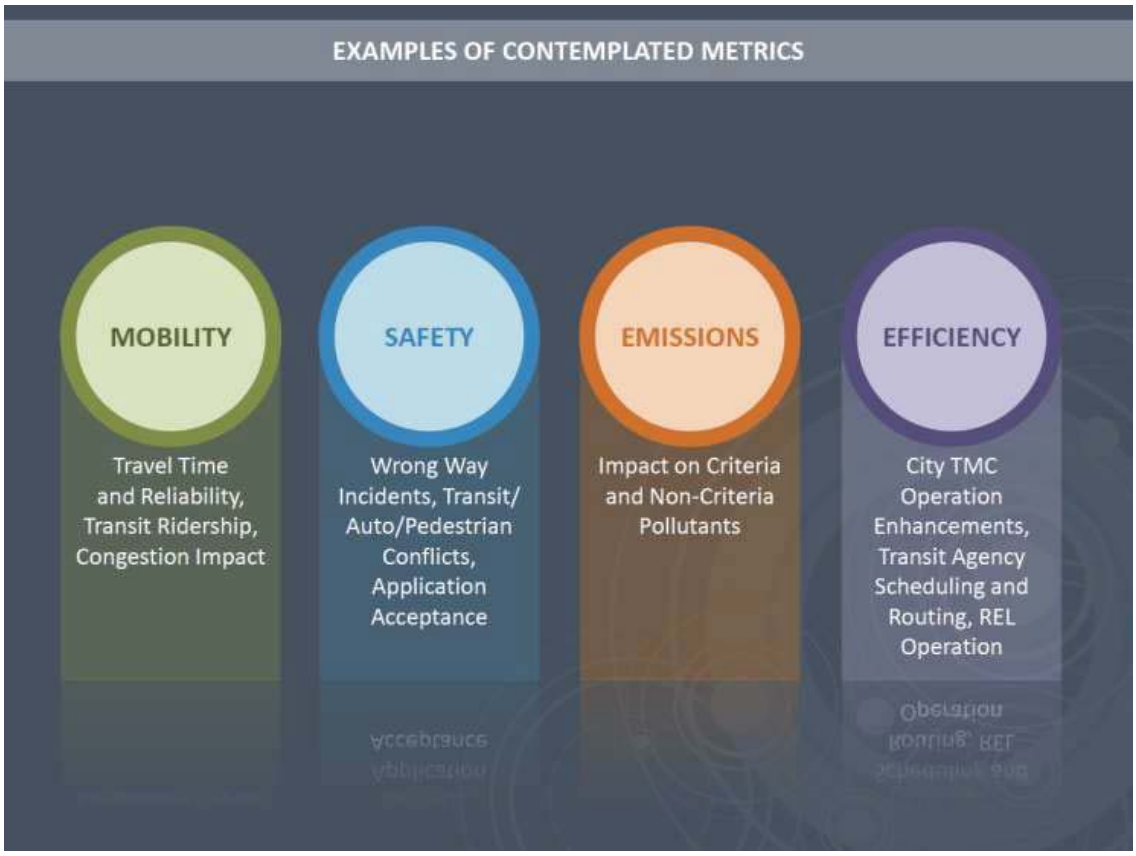
■ 考慮事項

KEY CONSIDERATIONS

- Work on Earlier Connected Vehicle Phases
- Appropriate Evaluation Criteria
- Data Availability vs. Cost
- Target Development - Analysis and Modeling Simulation (AMS) Tool
- Site-Specific Impacts and Corridor Impacts
- Coordination with Stakeholders
- Benefit/Cost
- Participant Training
- Qualitative and Quantitative Measures
- Mitigation of Confounding Factors
- Data Sharing

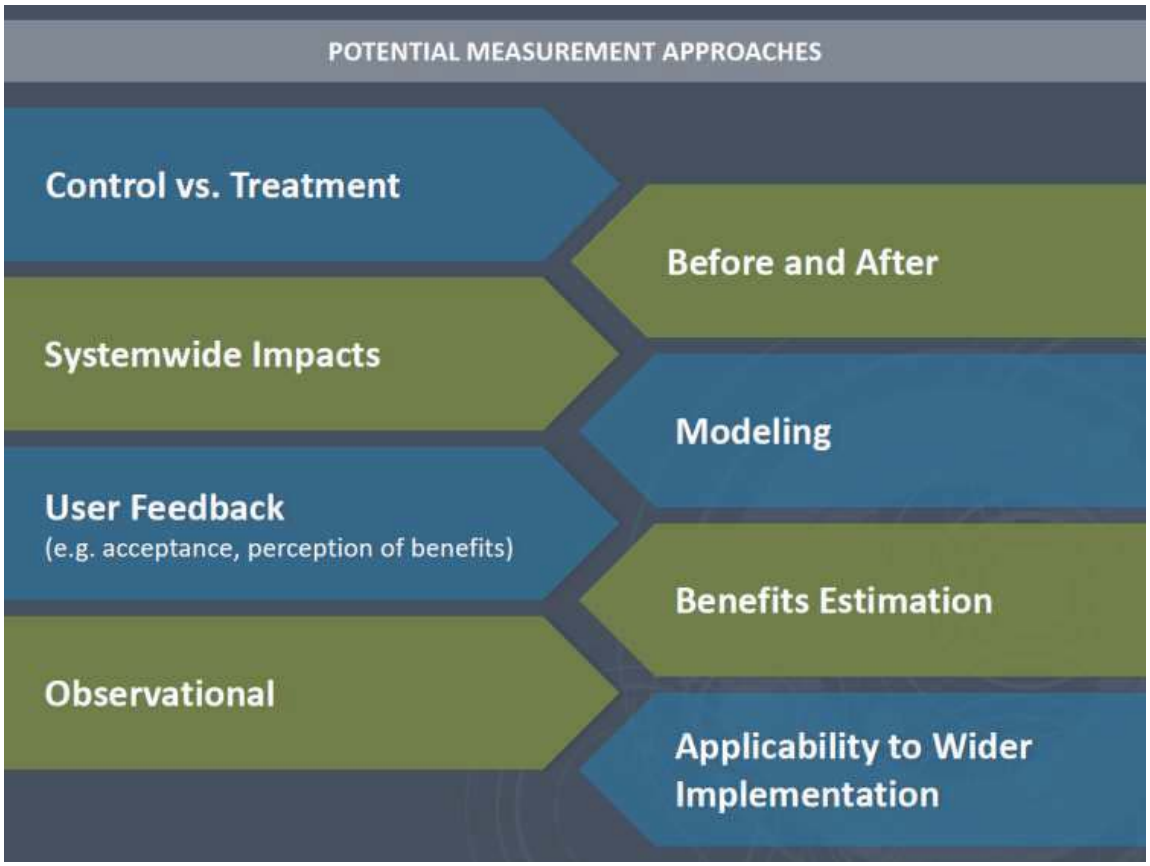
各地域の提案：Tampa・フロリダ州

■ 目的とする測定基準案



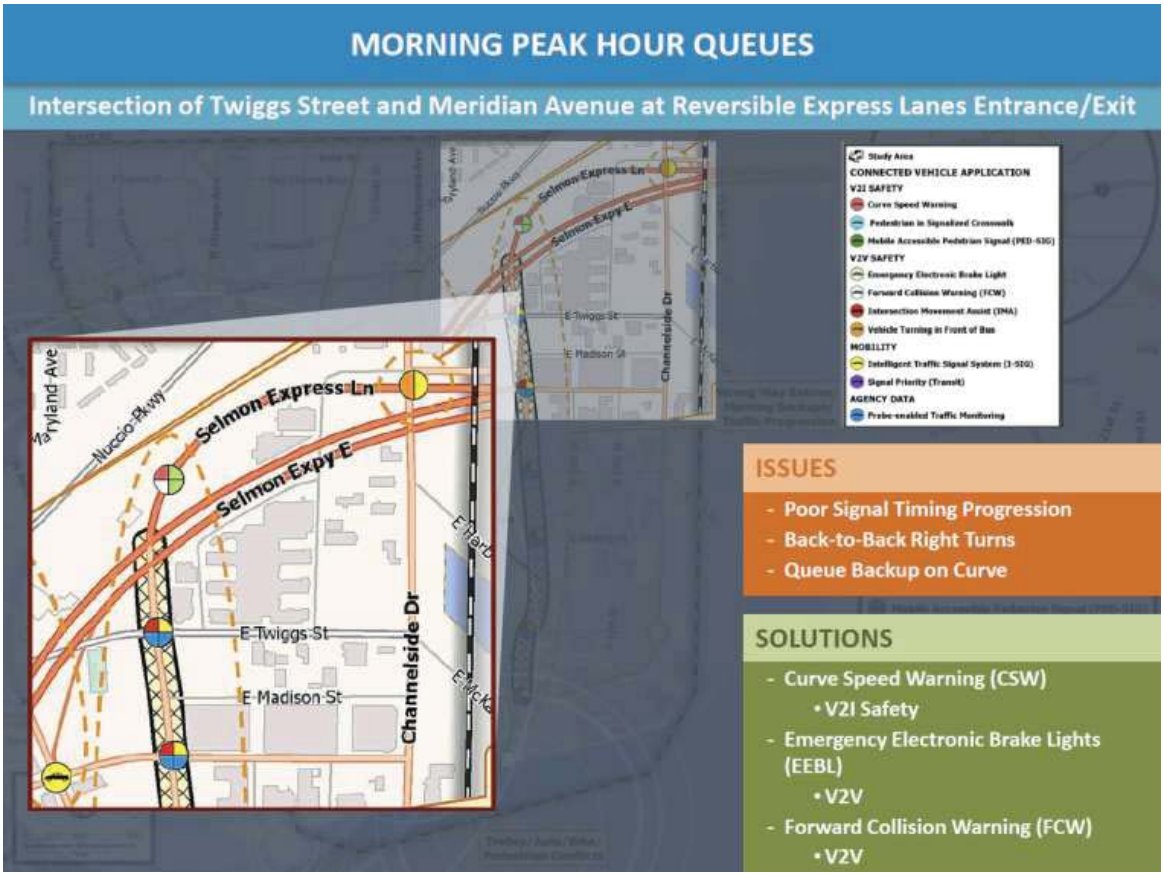
各地域の提案：Tampa・フロリダ州

■ 測定方式案



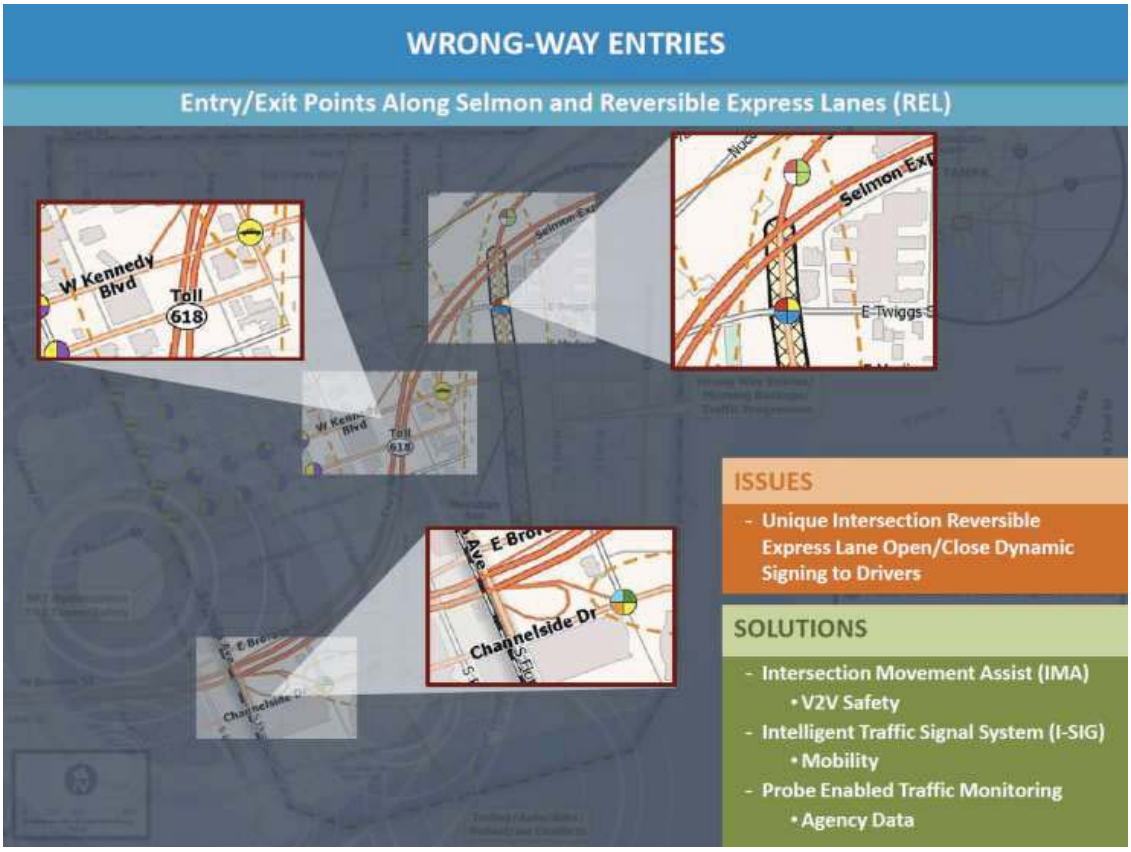
各地域の提案：Tampa・フロリダ州

■ 朝の混雑時の車列



各地域の提案：Tampa・フロリダ州

■ 逆方向入線

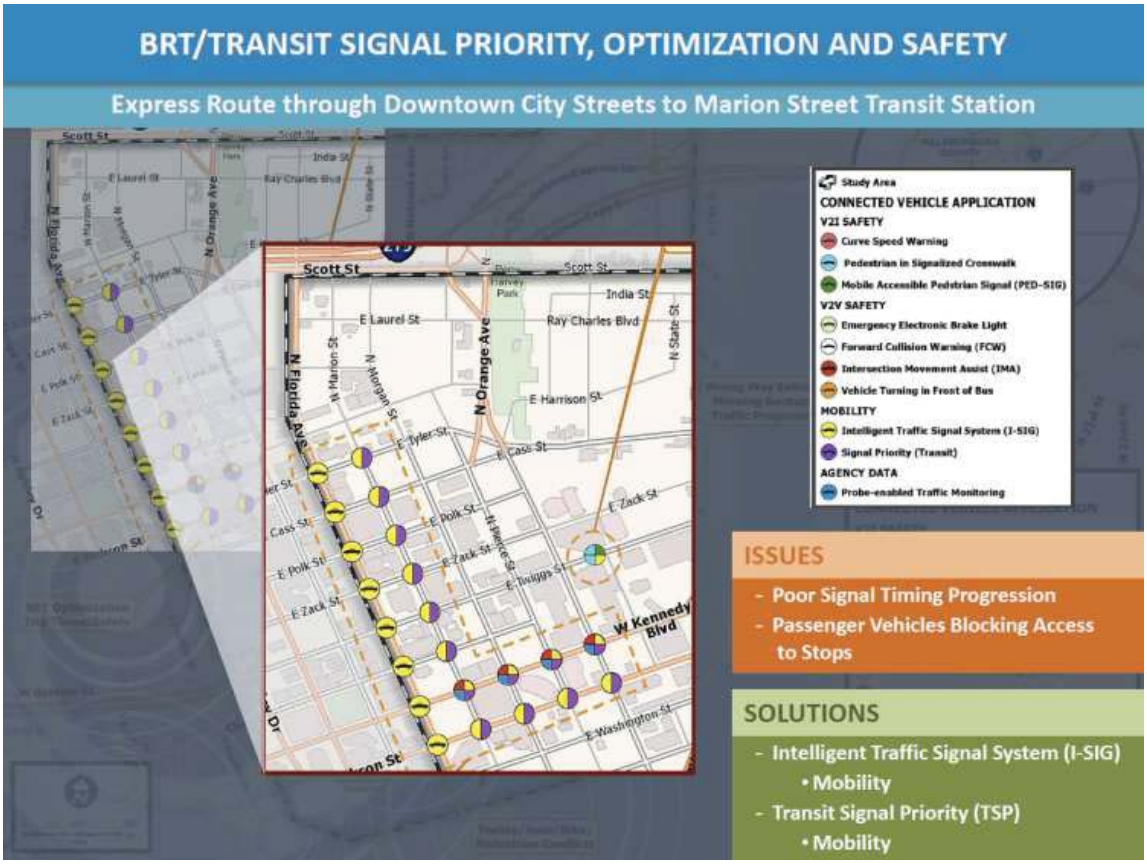


各地域の提案：Tampa・フロリダ州

■ 歩行者安全

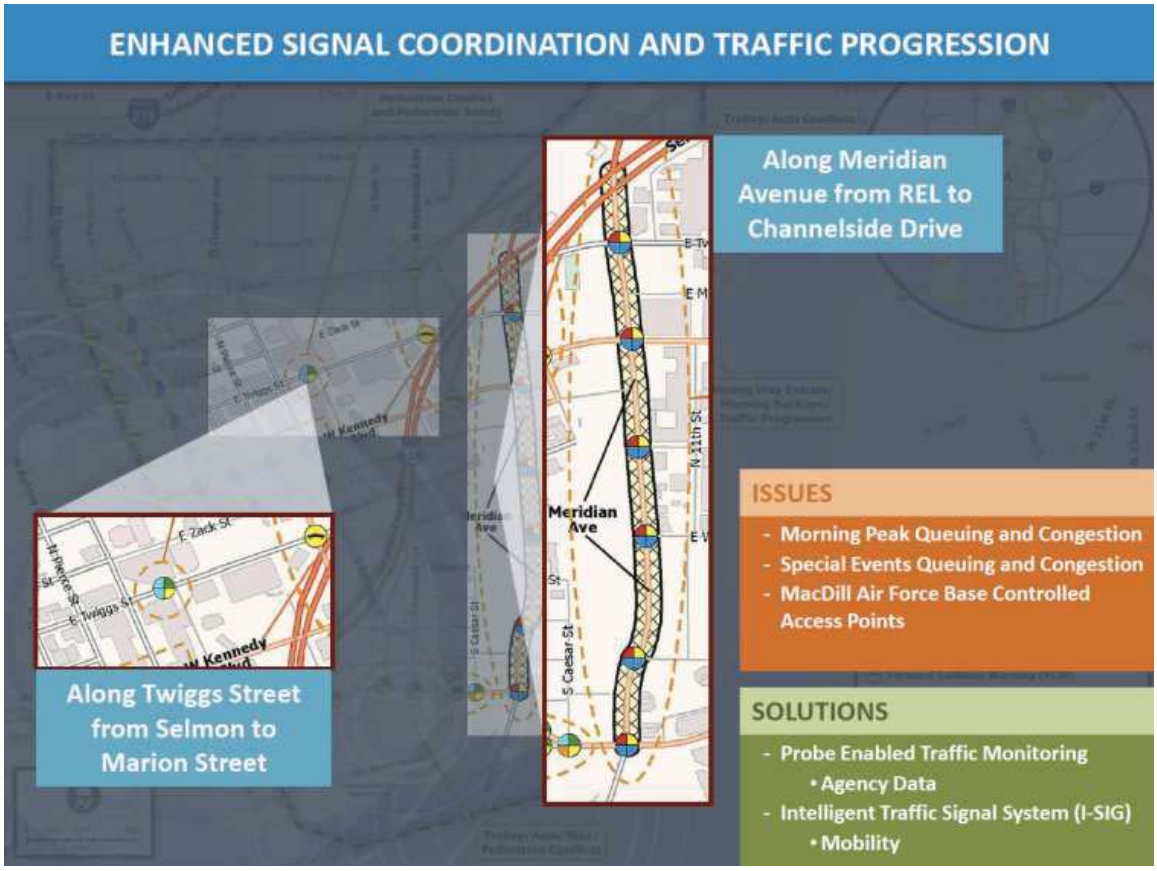
各地域の提案：Tampa・フロリダ州

■ BRTと輸送車の優先信号、適正化と安全



各地域の提案：Tampa・フロリダ州

■ 信号制御と交通進行の強化



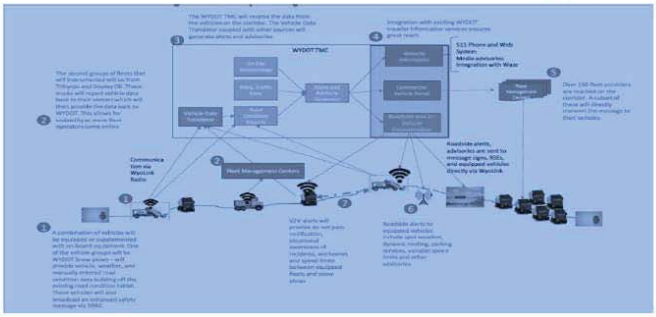
各地域の提案：Tampa・フロリダ州

■ ユースケース例1：逆走車に対する可逆レーン

各地域の提案：ワイオミング州

■ ワイオミング州の提案

Wyoming DOT Connected Vehicle Pilot Deployment Program



Overview

U.S Department of Transportation

Connected Vehicle Pilot Deployment Program Phase I

Kick-off Meeting

09/30/2015

各地域の提案：ワイオミング州

■ ワイオミング州の課題

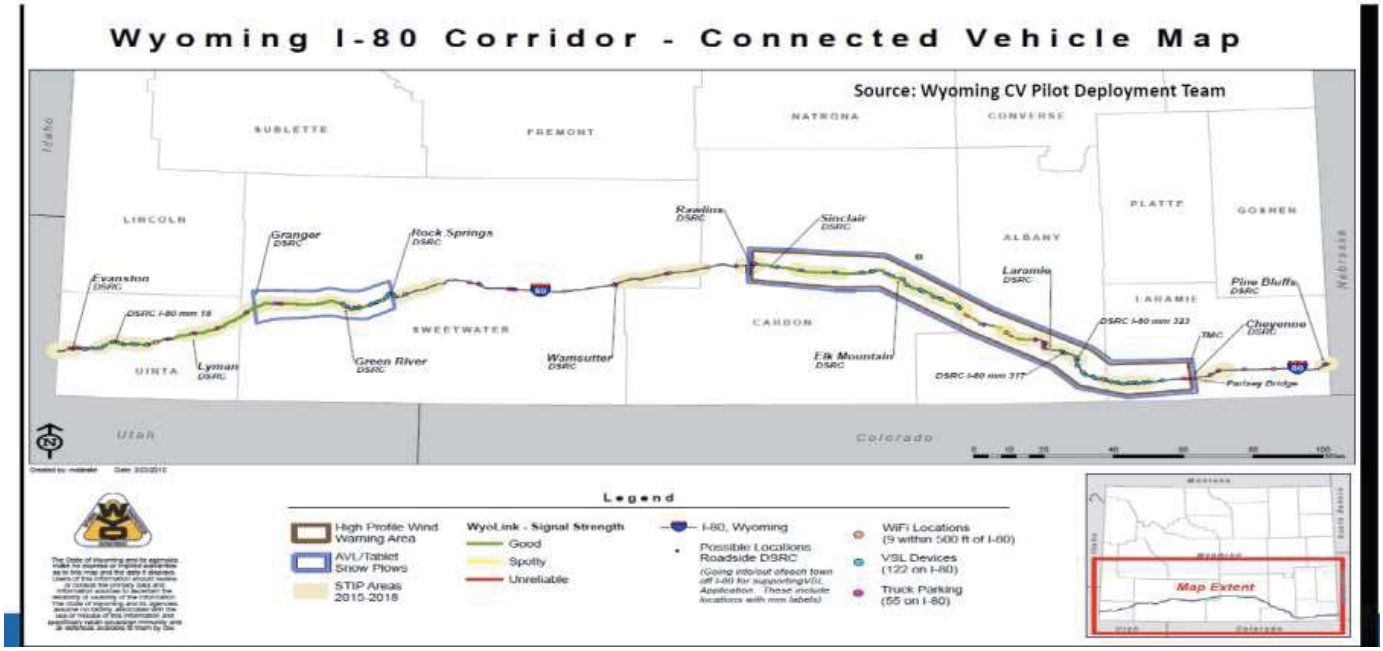
The Problem – A challenging mix of weather and road weather conditions

- Blowing Snow
- High-Wind
- Fires
- Visibility

各地域の提案：ワイオミング州

■ ワイオミング州のConnected Vehicle I-80コリドー

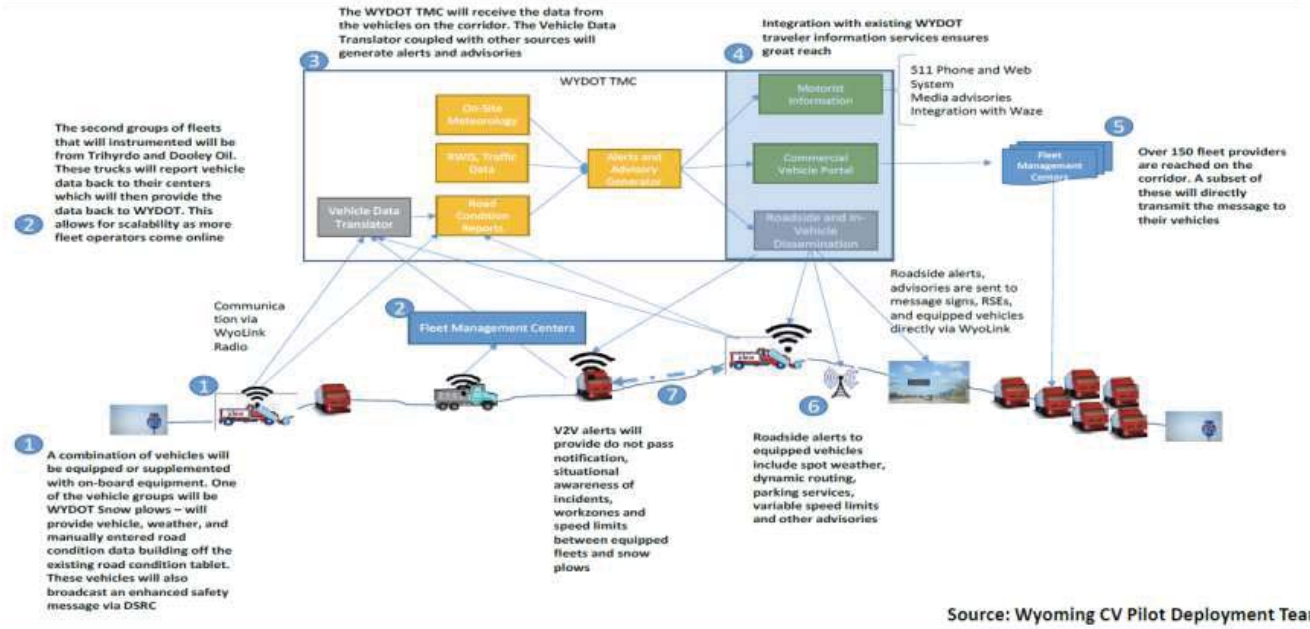
Pilot Location



各地域の提案：ワイオミング州

■ 対象と利用通信方式

Another View



Source: Wyoming CV Pilot Deployment Team

各地域の提案：ワイオミング州

■ 展開に向けたCVアプリケーション案

Proposed CV Applications for Development

- **Initially focused on Motorist Alerts and Advisories relating to weather conditions**
  - Spot Specific Weather Warnings
  - Variable Speed Limits
  - Speed harmonization

Also, existing traveler information sources (511, website, CVOP, app) will all be improved to incorporate information from connected vehicles

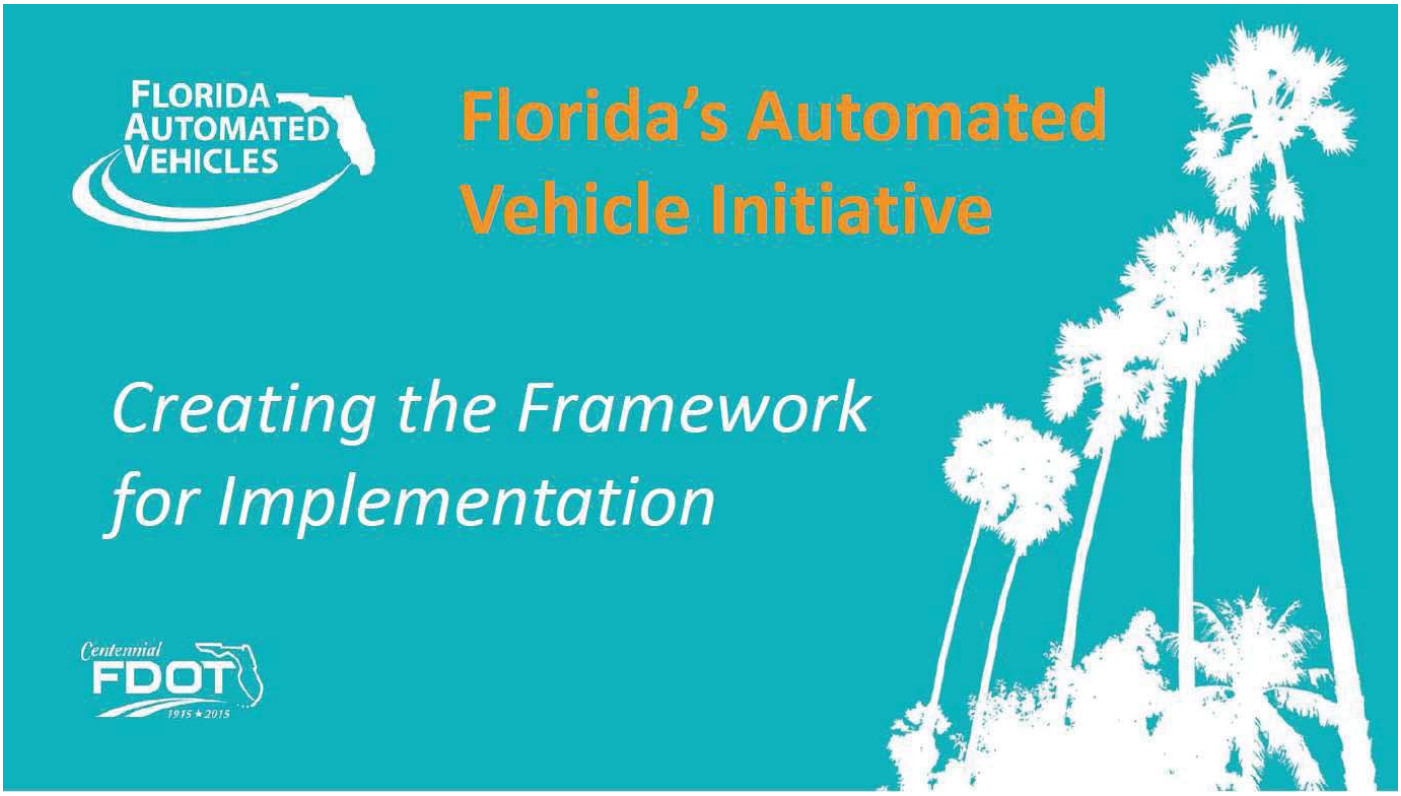
- **Create platform for future use based on user needs**
  - Work Zone Alerts
  - Truck Restrictions
  - Truck Parking
  - Curve Speed Warnings
  - Route guidance

米国：州の取り組み拡大

フロリダ州

フロリダ州の取り組み

■ フロリダが開始したプロジェクト



フロリダ州の取り組み

■ フロリダが開始したプロジェクト

Active FDOT Initiatives

- Connected-Vehicle Test Bed in Orlando (2011)
- Public Outreach and Education
- Florida Automated Vehicles Summits
  - 2013 – Tampa
  - 2014 – Orlando
  - 2015 – Jacksonville
- Stakeholder Working Groups
- University Research Partnerships
- Pilot Projects
- Stakeholder Working Groups

フロリダ州の取り組み

■ フロリダが開始したプロジェクト

Stakeholder Working Groups

1) Policies & Legal Issues
2) Infrastructure/Technology
   - Roadway improvements
     Roadside devices
   - Engineering & design standards
   - Infrastructure investment
3) Modal Applications
   Transit, Freight, Inspections

フロリダ州の取り組み

■ フロリダが開始したプロジェクト

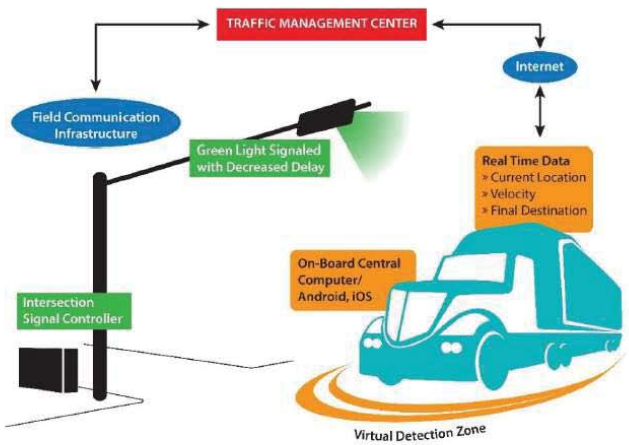
Pilot Projects

- Focused on reducing the frequency and severity of crashes
  80% of all avoidable collisions could be prevented
- Commercial vehicle applications
  Improved intermodal connectivity
  Reduce bottlenecks at ports
  Increased safety at intersections

FLORIDA AUTOMATED VEHICLES

Freight Applications Pilot Project

Assessing Automated Vehicle Technologies for Miami's Perishable Freight Industry



フロリダ州の取り組み

■ フロリダが開始したプロジェクト

Partnership Opportunities

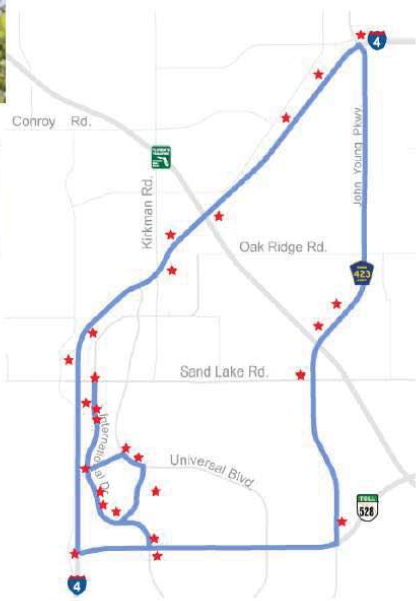
- Connected Vehicle Test Bed
- USDOT Connected Vehicle Pilot Deployment Projects

Centennial FDOT 1915 2015 | TAMPA HILLSBOROUGH EXPRESSWAY AUTHORITY | MDX MIAMI-DADE EXPRESSWAY AUTHORITY

- Development of Test Track
- FDOT is investing in AV/CV to rapidly deploy emerging solutions

SUNGUIDE Florida's Intelligent Transportation System

Connected Vehicle Test Bed in Orlando



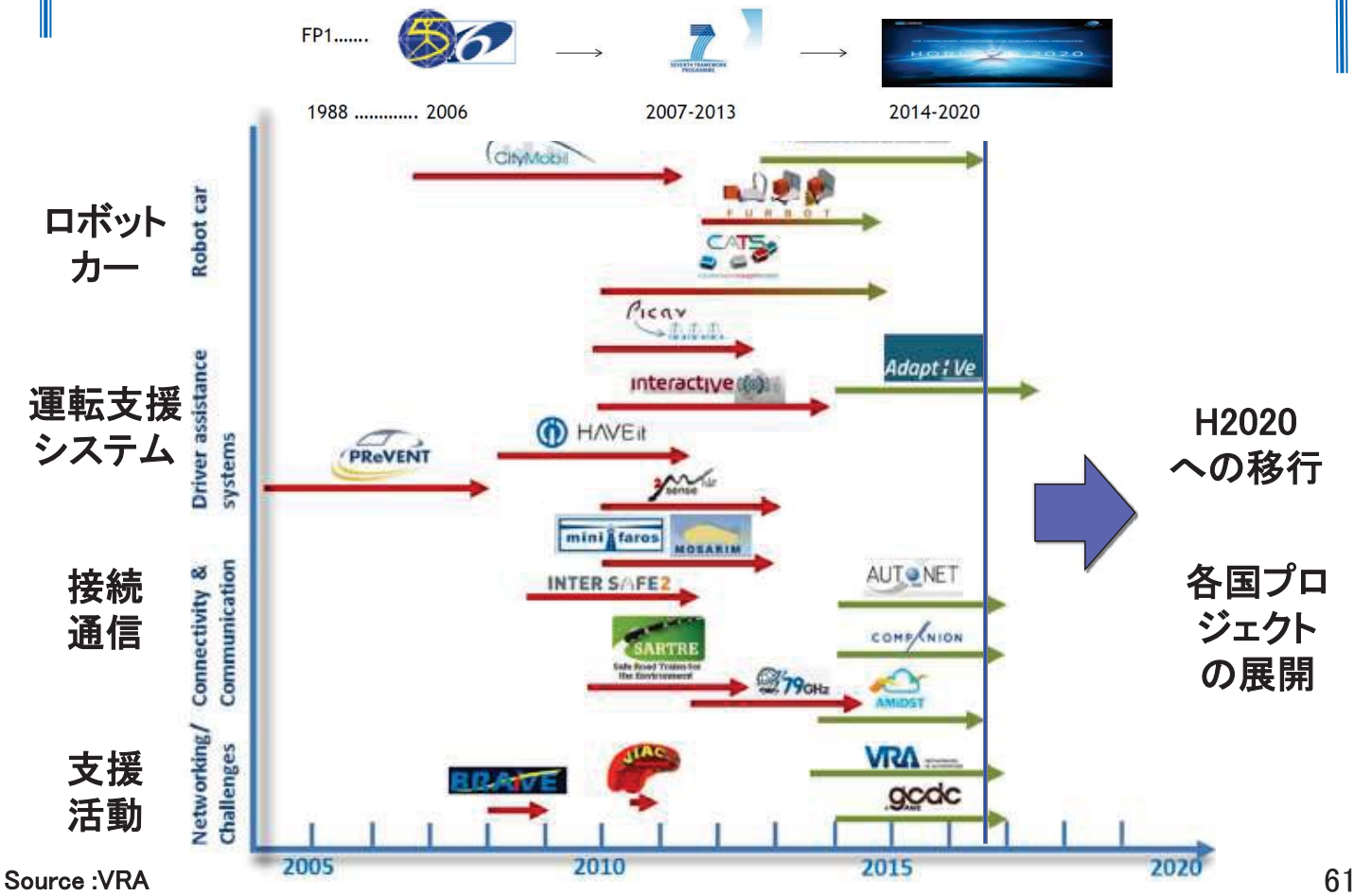
欧州動向アップデート

FP7からHorizon 2020プロジェクト

FP1..... → →

1988 ..... 2006 | 2007-2013 | 2014-2020

欧州自動運転プロジェクト概況



Source :VRA

Horizon 2020プロジェクト内容

■ FP7からH2020と各国プロジェクトへの展開が進む

H2020プロジェクト概要

トピック	タイトル	アクションタイプ	ステージ	予算(m€)	
				2016	2017
ART-02	乗用車用オートメーションパイロット	IA	2	48	
ART-04	移行期間に於ける自動運転の安全と利用者受容性	RIA	2		
ART-05	自動運転への移行を支援し、既存の車両と自動運転車両の共存する道路インフラ	RIA	2	13	
ART-06	自動運転を支援する活動	CSA	2	3	
ART-01	自動運転を実現するICTインフラ	IA	2		50
ART-03	公道での複合隊列走行	IA	2		
ART-07	都市道路交通の自動化デモンストレーション	IA	2		

CSA : Coordination and Support action, IA: Innovation Action
RIA: Research and Innovation Action

Source :VRA

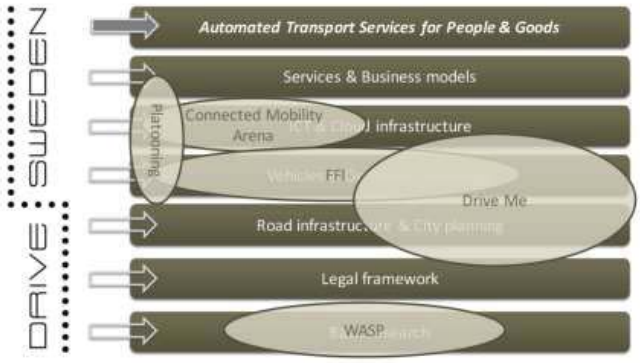
欧州：各国プロジェクト

欧州自動運転各国プロジェクト

ITS Japan

■ 各国プロジェクトの拡大が進む

- Sweden
- UK
- Netherlands
- France
- Germany
- **Finland**
- ・・・



Source :VRA

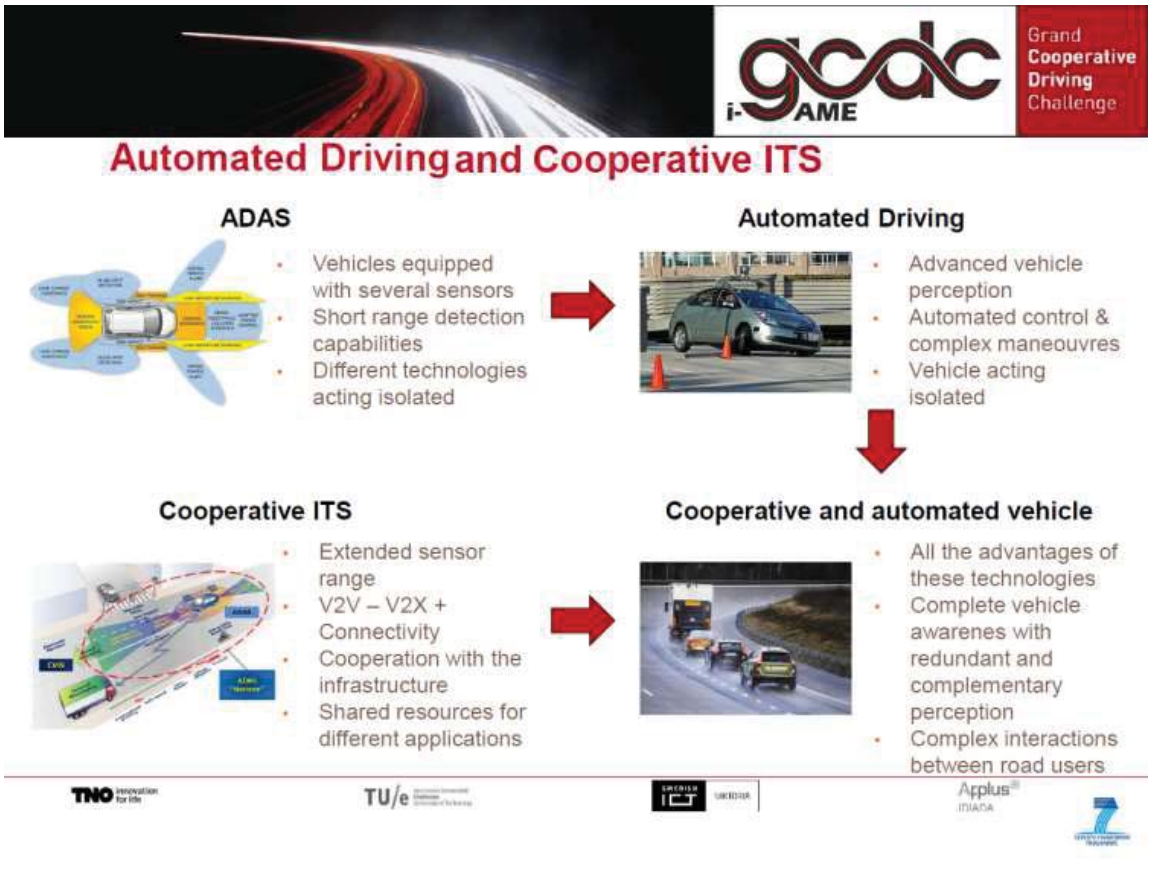
欧州：FP7プロジェクト進捗状況

i-GAME

i-GAME

ITS Japan

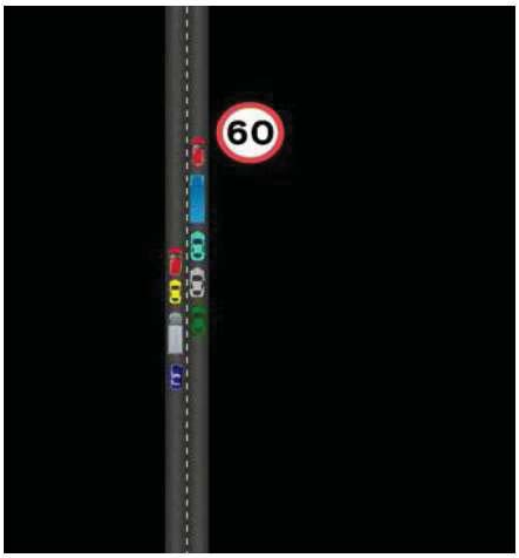
■ Cooperative and Automated Vehicleとして定義

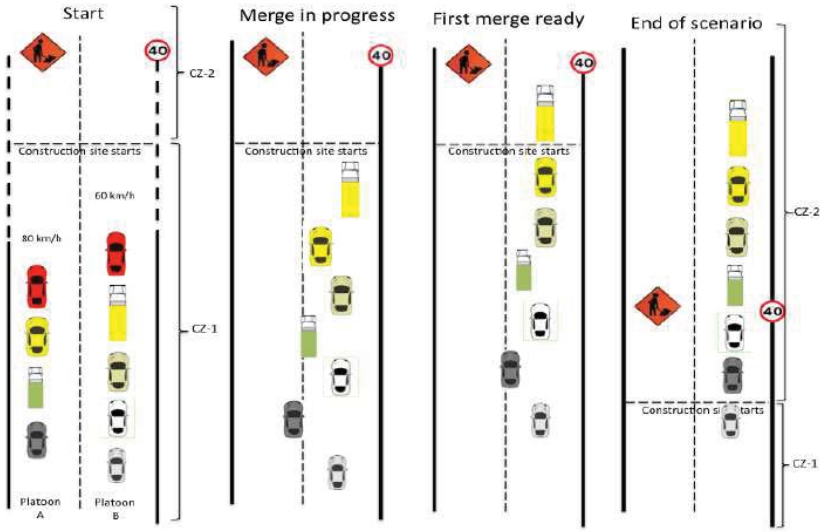


■ シナリオ：Automated Vehiclesによる隊列合流

Scenarios

Platoon merging with automated vehicles

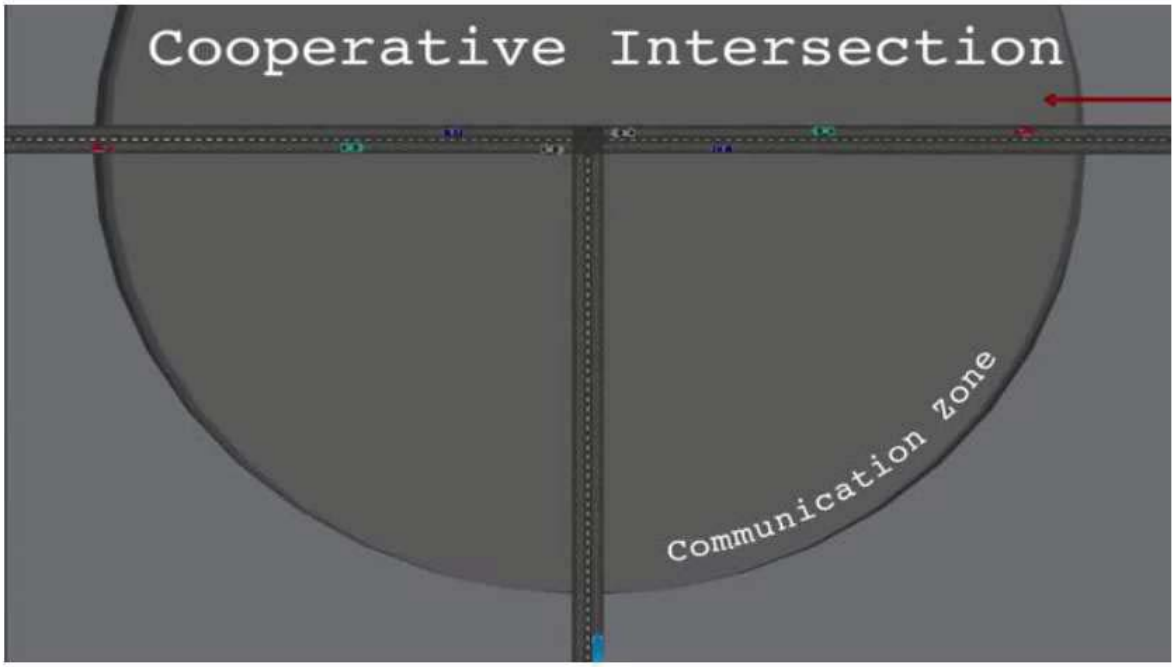




■ シナリオ：協調型交差点

Scenarios

Intersection with mixed traffic



■ Workshop：Helmond　2016年5月28日～29日

Workshops and challenge

- Scenarios and requirements
- Validation of vehicle performance
- Validation of message level interoperability
- Validation of interaction performance
- Validation of safety
- **Finally the CHALLENGE!**

EVENT DATE!!!!!
28-29 MAY - HELMOND



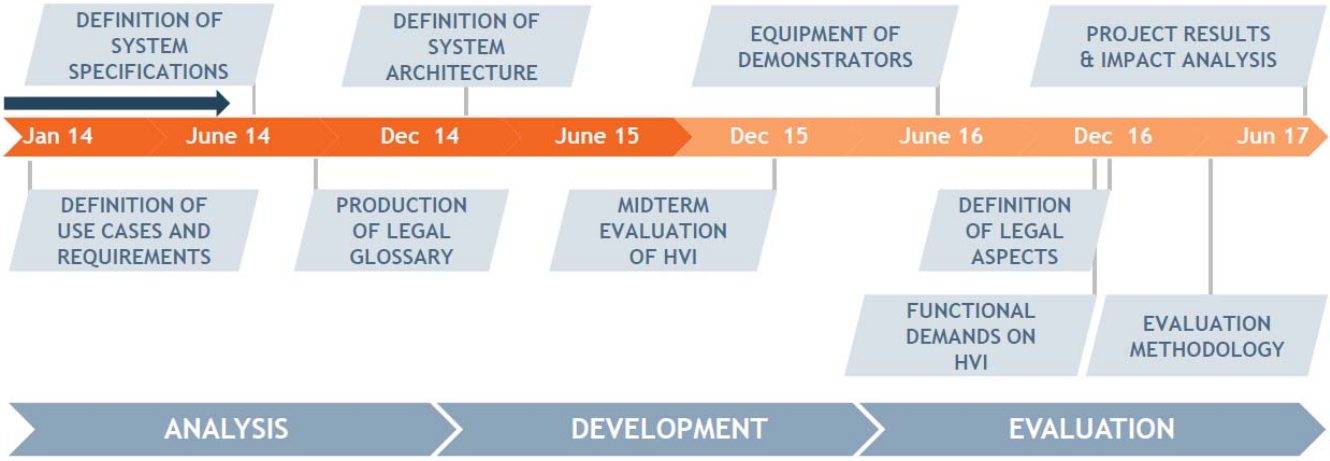
TNO innovation for life　TU/e　SWEDISH ICT VIKTORIA　Applus IDIADA

欧州：FP7プロジェクト進捗状況

AdaptIVe

AdaptIVe

■ Time line



AdaptIVe

■ リーガルに関するWorkshopを2015年9月17日に実施

- 主要議題
  - ✓ 法規、技術的承認、製造物責任
  - ✓ データプライバシー
  - ✓ 保険のモデル

//SP2 „RESPONSE 4“

- AdaptIVe held a project workshop on legal aspects of automated driving on 17 September 2015 at Federation of French Car Manufacturers in Paris, France.
- Nearly 80 experts participated
- Topics:
  - regulatory, technical approval and liability law
  - data privacy questions
  - insurance models
- Presentation are available: www.adaptive-ip.eu
- Deliverable 2.1 **“System Classification and Glossary“**

■ SP3 Human-Vehicle Interactionでの実績

Working tasks	Status	Next steps
Develop high level Use cases	Delivered	May be refined according to findings from our experiments
State of Art of the Human Factors research.	Provided	Continuously providing with new references, e.g. findings from our experiments and from technical progresses
Collect research questions and carry out experiments.	Seven experiments have been carried out.	Meta-analysis of the findings. Identify relevant research topics and plan for the next round of experiments.
Create functional requirements and strategies for collaborative automation.	A first version Human Factors requirement catalogue has been created.	The Human Factors requirement catalogue is continuously updated according to the findings from our experiments. Final catalogue will be delivered at the end of the project.
Close dialogue with the other SPs in the project in order to identify relevant research topics.	Established structure and routines	Continue the dialogue and provide support regarding the human-vehicle integration in the demo-vehicles
Provide input to the system architectures.	Dialogue established	Provide support as the systems development is progressing.

■ Highwayでの合流条件での協調課題の検討

END