

Building Strategic Partnerships to Drive Transportation Research Innovation

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**PLANNING
ADVANCEMENTS IN
TRANSPORTATION AND
HOUSING**

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Outline

- Introduction
- Three cases of partnerships, mixed set of actors



Background



Partnership



Lessons, wins, and adjustments

- Reflection

Transportation, planning, policy

- (Mostly) applied research
 - To address contemporary problems
 - As a way to improve the human condition
- Building on basic research
 - Design of chips and algorithms for AI
 - Consumer welfare and externalities
 - Notions of justice and fairness
- Within a context
 - Actors, conditions, challenges or potential changes

Three transportation-related partnerships



Pacific Southwest Research Center



University of California Institute of
Transportation Studies



Berkeley Deep Drive



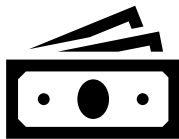
Pacific Southwest Research Center & Caltrans

Background

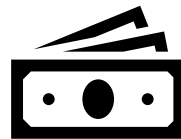
- University transportation centers authorized by US federal transportation bill
 - Support for these centers ebbs and flows over time
- Priority topics described in RFP, with centers specializing
- Three center types authorized
 - Regional centers (geography)
 - National centers (topic)
 - Tier 1 centers (topic)

Background

- Regional Center: Pacific Southwest Region
- 10 universities involved, 6 in CA
- ~ \$ 2 million /yr, requiring 1:1 match

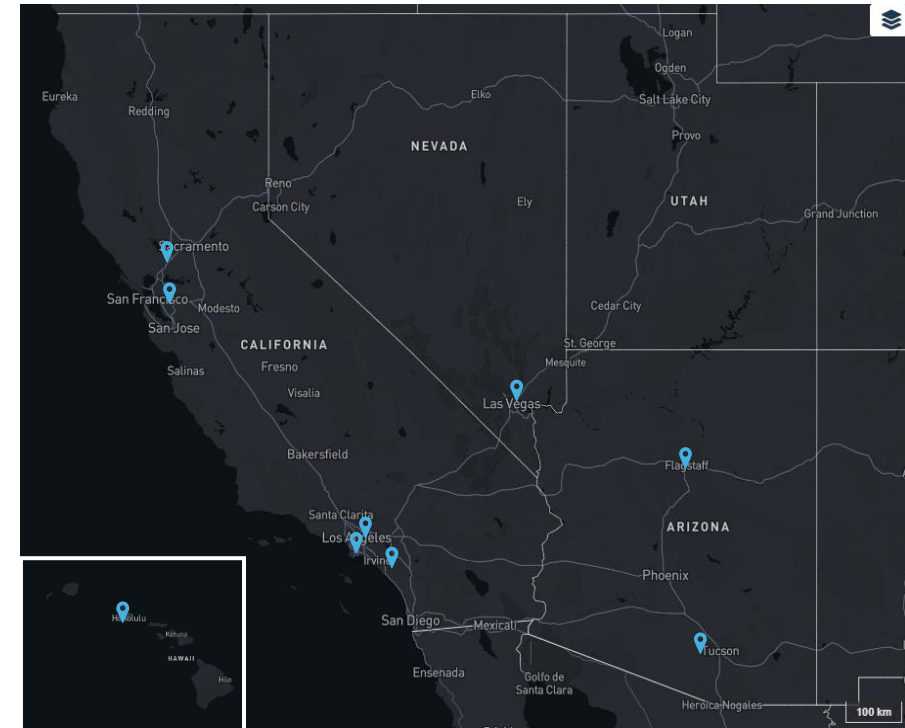


Federal

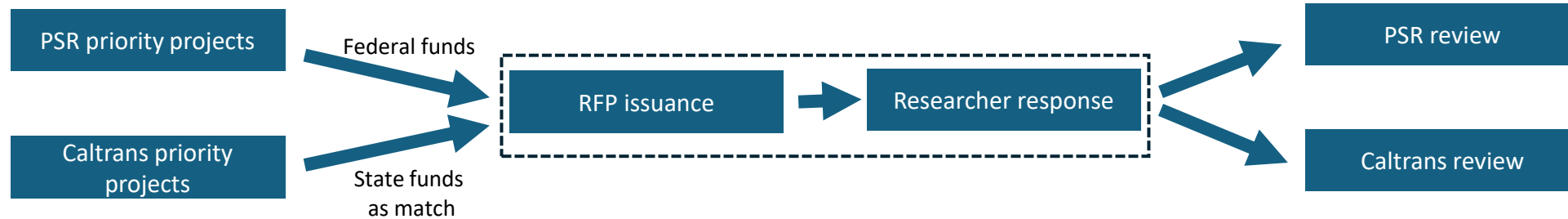


Non-federal

- CA match portion supplied by state DOT



PSR-Caltrans arrangement



- Benefits: Unified RFP + match support
- Applicants' budgets for PSR (federal) and Caltrans (state) funds capped for each university (based on allocation/match need)
- Caltrans retains responsibility to select match desirable projects
- Universities contract with Caltrans for projects selected

Lessons, wins, and adjustments



- Good way of addressing key research needs at the state
- Well-defined and understood process, despite complexity
 - Six CA universities involved
- Projects tend to be tactical

Investigating the Feasibility and Viability of Using a Wireless Low Power Wide Area Network (LPWAN) as an Alternative Connectivity Method for Narrowband Public Transit Applications in Unserved and Underserved Communities

Callexico East Land Port of Entry (POE) Commercial Vehicle Appointment System (CVAS)

- Timing of contracting with Caltrans means delays and difficulties (for ‘proving’ match, HR, students, etc.)

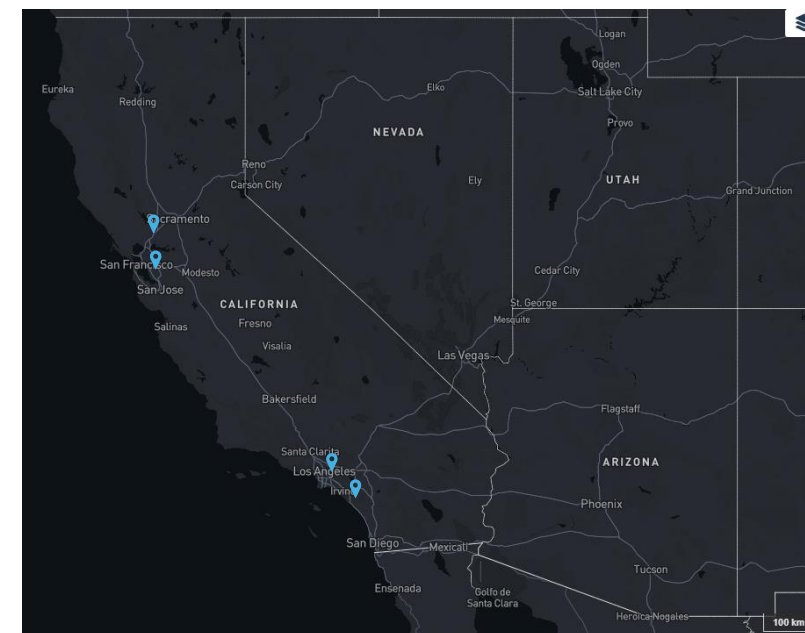


University of California Institute of Transportation Studies and the State of California

Background



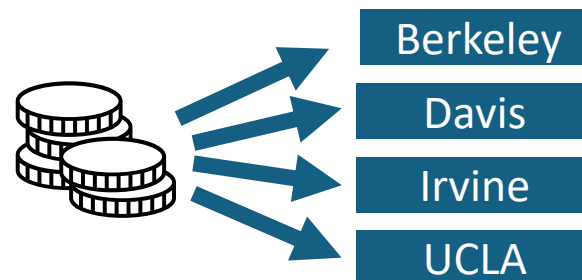
- CA Senate Bill 1 – “Road Repair and Accountability Act” aka gas tax bill
 - Over 10 yrs, expected to raise \$50 billion
 - Dedicates ~\$5 million/year for four ITS branches (Berkeley, Davis, Irvine, UCLA), together
 - Marks formation of UC ITS, a multi-campus research unit
 - Goals:
 - Advance research in support of state transportation goals
 - Connect researchers to practitioners and policy/decision-makers
 - Inform policy



Partner arrangement



- Wait, who's the partner? There are at least two partnerships
- Partnership 1: The four UC campuses (Berkeley, Davis, Irvine, LA)
 - Long history of collaboration, and competition
 - Need for strengthening trust
 - Established bylaws governing collaboration across campuses
 - The creation of UC ITS, originally mostly a passthrough organization for funds
 - Funds split evenly across the campuses



Partner arrangement



- Partnership 2: UC ITS and the State
- Bill specifies involvement of legislative and executive branches in a Board of Advisors

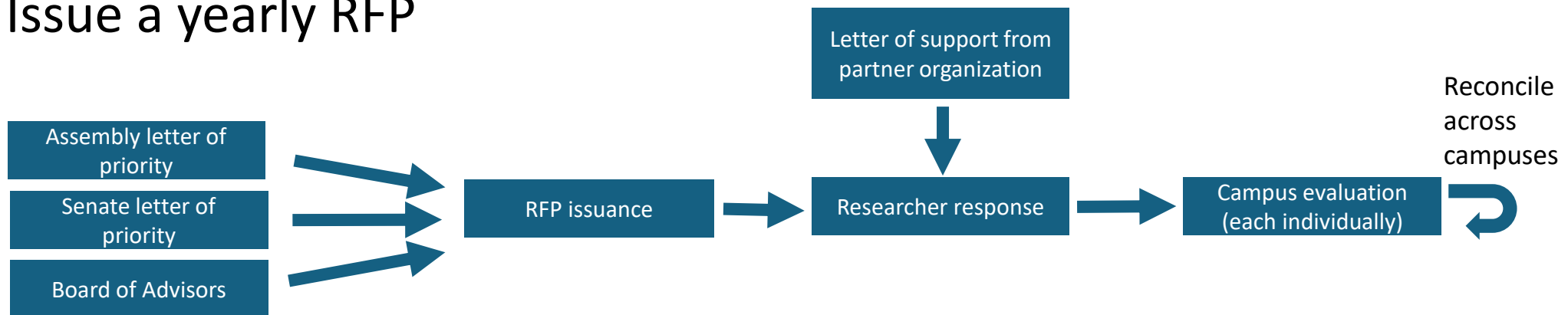
California Air Resources Board	California State Transportation Agency	Budget subcommittees
California Energy Commission	Caltrans	Assembly Transportation Committee
California Transportation Commission		Senate Transportation Committee

- Agencies or legislature do not contribute funding



Partner arrangement

- Board of Advisors helps identify research needs/priorities
 - Assembly and senate chairs produce letter with request
- Each campus invites up to 4 additional members to the Board (planning organizations, transit agencies, non-profit organizations, private sector)
- Yearly priority setting sessions with Board
- Issue a yearly RFP



Partner arrangement



- Dissemination and engagement plans, included
 - Research policy briefs or syntheses (required)
 - Webinars

Lessons, wins, and adjustments



- External parties (advisors, partner agencies)
 - Research priorities suggested by Advisors are urgent, but not the most important
 - Assembly and Senate letters were initially too specific
 - Engineering study of rail station siting
 - Required outreach about the type of projects that were feasible
 - Turnover among Advisory Board members
 - Assignment of elected officials and their staffers to committees
 - Varying engagement of executive branch
 - Some partner agencies overwhelmed with requests for letter of support (5+ requests)
 - Centralized clearing of letters within 'popular' partners

Lessons, wins, and adjustments



- External parties (advisors, partner agencies)
 - Smallish projects meant lots of output



700+

Publications (peer-reviewed journals, reports, briefs)



30

Webinars sharing research results

- “Drinking out of a firehouse”
- Pivoted to more targeted engagement
 - Allowing journal articles instead of briefs – this didn’t work
 - Legislative briefings
 - Informational hearings
 - Mini summits + one-on-one engagement

Lessons, wins, and adjustments



- Internal to our organization (UC ITS)
 - RFP was too specific (in one instance, 21 pages of possible projects!)
 - Relatively small grants ~ \$100,000 (1 student research assistant, 1 month of summer salary for the researcher) precludes larger, more ambitious projects
 - Encourage multi-year, and multi-campus proposals
 - Varying capacities at each campus to conduct the research (bandwidth)
 - Great way to support students/researchers
 - Increased need to centralize some activities
 - Outreach to state partners
 - Website/communications
 - Yet, maintain the centralized organization mostly as a shell (hiring done at campuses)

Lessons, wins, and adjustments



- Effective outreach, demonstrated value to partners results in additional one-time authorization of \$10 million in 2021, to be spent over four years
- Legislative actions resulting from the funding support
 - Road safety
 - Transit finance & ridership
 - Decarbonization
 - VMTs and GHGs
 - Micro-mobility, microtransit, & shared mobility



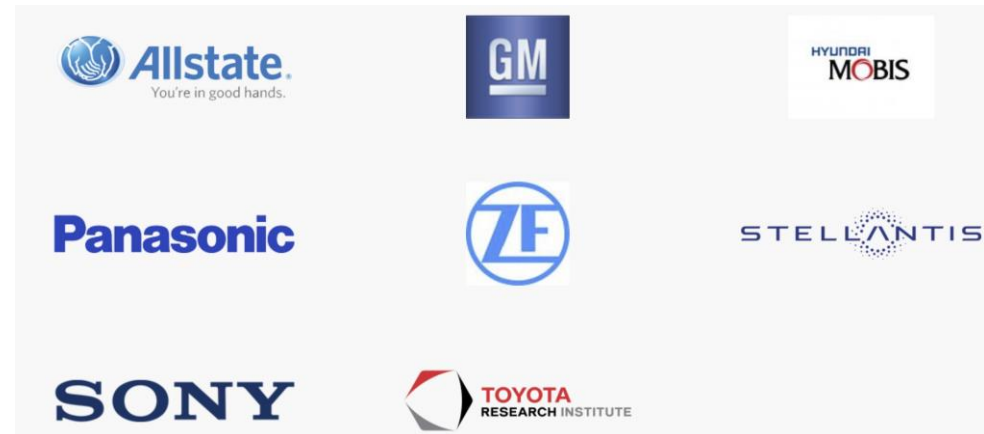
Berkeley Deep Drive Consortium

Background

- 2017 computer vision revolution feeding into vehicular automation (Waymo, Zoox, Maymobility, Cruise, Tesla, Ford, etc.)
- Berkeley Deep Drive (BDD) emerges as catalyst for campus expertise and private sector needs
 - Consortium model
 - Aimed at the private sector only

Partner arrangement

- Two entry points
 - Supporter tier (base participation)
 - Conference attendance
 - Conference interaction with researchers, supporters and partners
 - Access to student pool
 - Partner tier (higher participation)
 - All activities of supporter tier
 - Define broad areas of research* as RFP input
 - Be exposed to a broad set of research ideas
 - Select research projects, co-fund/pool if needed
 - Early access to funded project results
- *Object detection, representation and tracking in 3D; trajectory prediction; AV-driver interactions





Lessons, wins, and adjustments

- Effective 2016-2024
- IP could stay with the university – mature industry
 - The value was in bringing applications to market in different levels of vehicular autonomy
- Timing (in different ways) was key
 - Interest among industry participants
 - Competitive environment, where time to market was important, giving value to early peek on results
- Two –step mechanism for involvement worked well
- Excellent opportunity for students and faculty



Lessons, wins, and adjustments

- Good ideas not funded
 - Not aligned with any partner; or required much more money
 - What happened with those great ideas?
- Good ideas get even better
 - Pooling of funds from supporters
 - Addition of more funds by a supporter
- Alignment of university processes with private sector timing not easy
- Fortuitous timing

General reflections – key elements



- Partner alignment with key goals
 - Why are we here and what do we want to achieve together?
- Having university bureaucracy on board
 - Some support from above
 - The “yes” people are key at the mid-level
 - Innovative solutions to expected complications and contingencies
- A core set of university researchers on board, who:
 - Can do the work
 - Interested in engaging (!!)
 - Show flexibility (delayed approvals, small changes in scope, etc.)
 - Tougher on non-academic researchers

General reflections – key elements



- Have organizational flexibility
 - Maybe we can do this a little differently? – every partner willing to make some concessions
- Develop trust within the partnership
 - Make effort to socialize within
- Importance of leadership & selfless investment
 - Research that has impact and meaning
 - Most beneficiaries accrue to the public, partners, and researchers/students
 - Partnership leads will get the headaches, not the accolades