

Discussion Themes

These are the raw comments from the situation assessment meeting discussion, collected from verbal contributions, contributions to the Jamboard, and contributions in the meeting chat, grouped into themes. We grouped the comments into themes arising from the comments themselves (i.e., we didn't pre-define themes to fit comments into), then read back through the themes to see if there were groups that needed to be combined, split, or comments that needed to be recategorized. Within themes, comments are otherwise unordered and have not been substantively changed from the original contribution. We removed any personally identifiable information from these comments. From these themes, we created short narrative summary.

What motivates you to collaborate on bike, pedestrian, and accessibility infrastructure data?	4
Work Towards Modal and Social Equity	4
Realize Safety, Environmental, and Health Benefits	4
Improve Quality of Life and Lower Transportation Barriers	4
Improve Planning, Decision-Making, and Performance Management	5
Support Policy and Investment that Promotes Active Transportation	5
More and Better Research.....	6
Data Standardization, Interoperability, and Collaboration	6
Misc.....	6
What are the best possible outcomes, or outputs, from a collaboration around these data?	7
Create or Adopt Standards	7
Develop End Products.....	7
Publicly Accessible Data Covering the Nation	7
Data Production and Consumption Tools.....	8
Adjacent or Derivative Data.....	8
Clarify Data Governance	8
Change Policies to Support Data Collection and Maintenance	9
Clarify Data Collection Methodologies	9
Realize Downstream Social, Environmental, Safety, Health, Cultural Benefits	10
End Products Fulfill Specific Use Cases	10
How does your work help other organizations? Or, how does the work of other organizations help you?	11
Data Producer	11
Data Consumer	11
Data Enabler	12

Misc.....	12
What questions or uncertainties do you have in your work on - or the state of - these data?.....	13
Misc.....	13
Use Cases	13
Data Findability.....	13
Data Producibility	13
Funding	14
Status of Standardization.....	14
Data Archiving.....	14
Schema Details.....	14
Interoperability and Integration	15
Data Quality and Maintenance.....	15
Political Will and Policy	15
Licensing.....	15
Data Sources	16
Authoritativeness.....	16
Data governance.....	16
Role of OSM	16
What do you take as a "given" about the state of these data?	17
Lack of standardization	17
Poor quality data	17
Data gap.....	17
Barriers are non-technological	18
Ground truth is in flux.....	18
Inequitable data across modes.....	18
Inequitable data across geography	19
Misc.....	19
What knowledge, expertise, or experiences are necessary for a successful collaboration?	20
Front-line staff and experience	20
Planners	20
Data producers	20
Data consumers	20
End users.....	20

Data Standardization	21
Collaborative data governance.....	21
Integrated Data.....	21
Legal issues	21
Funding	22
Interdisciplinary and multi-level expertise	22
Misc.....	22
What is the purpose of bike, pedestrian, and accessibility infrastructure data? How will you use it?	22
ADA compliance and physical accessibility.....	22
Safety	22
Disaster management.....	23
Planning	23
Navigation	23
Research and analysis.....	24
Motivating policy change.....	24
Misc.....	25
True collaborations share resources. How do you think you might contribute?.....	25
Can you contribute expertise?.....	25
Can you contribute relevant experience?	25
Can you take on a leadership role?	26
Can you provide administrative support?	26
Can you enter formal engagements, such as MOUs?	27
How much time can you commit (hours per month)?	27
Funding and data collection tools	27
QA/QC.....	28
Potential use cases	28
Related Thoughts	29

What motivates you to collaborate on bike, pedestrian, and accessibility infrastructure data?

Work Towards Modal and Social Equity

- US Access Board: lack of data parity between active/accessibility and automotive so that it's easier to justify investment, policy
- Motivation: humans are not slow-moving cars, so we should not be modeled as such. Having detailed ped/bike routing graph data allows for personalized routing!
- To provide equitable, safe access for all users.
- Making public spaces safer, more inclusive, and accessible for people with different levels of ability
- Making sure that everyone can safely, efficiently, and comfortably get to the destination, regardless of their mode of transportation.
- Need for infrastructure access for people with disabilities.
- Addressing disparate impacts in historically underserved communities.

Realize Safety, Environmental, and Health Benefits

- to make biking safer and get more people on bikes!!
- Sustainability (no fossil fuels), public health (active transportation), and safety (no traffic deaths/injuries)
- For HEALTH, WEALTH, and EARTH
- Building non-motorized infrastructure is a safety and health investment.
- Motivation: Bike/ped as a social determinant of health, providing safe places for physical activity.
- My motivations are improving safety for people walking and bicycling, and improving equity for folks who rely on walking/bicycling/transit to get around.
- Reduce VMT and air pollutant emissions

Improve Quality of Life and Lower Transportation Barriers

- Quality of life for people who can't don't want to drive.
- Make seamless journey planning easier for the public across modes.
- I am frequent user of the AT (bike ped) system in my city and others, and I realize the great potential that is out there for a mature AT network to greatly enhance the quality of life
- Improve ability of people with disabilities to move through community, especially in unfamiliar locations.
- Goes towards saving lives and making a better transportation system for all modes
- It's important for trip planners to be able to make comprehensive multi-modal plans.
- Improve quality of life/places
- Making cities more livable and pleasant to move around in.
- Better routing for multimodal trip planning!
- Less mental energy needed to plan a bike route - mental energy is real energy, and people give up and choose another mode.
- Desire to find and help others find active transportation opportunities

Improve Planning, Decision-Making, and Performance Management

- Clear prioritization schemas for accessibility, walkability, sustainability, and active transportation planning
- Better decision making and use of limited resources
- They are part of the transportation system we manage and maintain so it is not a part of motivation but rather a necessity
- The public is used to having lots of data, and they expect us to know where our bike/ped infrastructure is and how it works.
- In order to improve and expand AT networks you have to know what you have
- The AT network is comparatively (to road & transit) immature...the impact of investments will be great. We need great data to share vision, prioritize investments, & support users
- Before we can prescribe solutions, we must be able to describe what we have!
- to help highlight where people can walk and bike
- We can't measure what we don't know exists.
- Working with multiple DOTs who want more nuanced destination access data
- Measure what matters.
- Making sure that pedestrian data connects and supports construction programs
- We can't build new (wisely) if we don't know what we have already.
- To ensure the data designed and collected support data-driven decisions.
- Better data = better decisions for planning and funding decision (at all levels of investment)
- to identify gaps in infrastructure for planning purposes
- I work in the "safety" area, so having data is paramount to getting my work done and in seeing what impact we have.

Support Policy and Investment that Promotes Active Transportation

- The foundation of our transportation system is our ability to walk. I believe if we build from that mode up, we will be most successful. So, we should start with sidewalks, then bike...
- Network-scale assessments to make walk/bike/roll transportation possible for everyday needs.
- Promote active transportation
- We need more/better walk/bike/roll infra. We can't do that if we don't know where we have it!
- To accelerate progress towards building better bike networks, to make biking a viable transportation option in all parts of the country.
- Improve safe, convenient active transportation to encourage mode shift
- To help in the decision-making process for ped/bike facilities and, overall, for having Complete Streets.
- Having support for investment in AT.
- minimize trips by car
- Support for investment in AT safety.
- Interdisciplinary teams are required to create significant improvements in bike, ped and transit infrastructure.
- Bike and pedestrian infrastructure are key to more sustainable transportation - so we need to describe and publish data for that infrastructure

More and Better Research

- It lays a solid foundation for micromobility related research.
- to conduct before/after studies on improved bike infrastructure to see if it has made the facility safer and/or encouraged more ridership
- Grist for health research
- Safety analysis and research projects

Data Standardization, Interoperability, and Collaboration

- When one person submits data, they have access to everyone's data. What benefits one, will benefit all.
- create a comprehensive sidewalk network for other to build upon.
- Speaking the same language re: data - need some level of authoritative agreement on standard data representation
- I want data that is suitable for state-to-state and/or city/county comparisons, so we can understand current conditions, needs, and progress
- hopefully see some mandates similar to asset mgmt

Misc

- Also, to improve AV use.
- This kind of problem can only be solved decentrally
- Making our data available to the public in an easy, efficient and complete way.
- So it can be viewed later
- high fidelity data will power the next generation of apps and make places more accessible
- Since 2010, pedestrian and bicyclist fatalities have increased 70%. We can and must do better!

----End of question

What are the best possible outcomes, or outputs, from a collaboration around these data?

Create or Adopt Standards

- Network standard specification
- Standardization and creating a real collaborative space to do large-scale mapping and quality control.
- Have there been conversations with standards making bodies?
- Standard network specification + LTS-like common classifications
- Standard data elements that can be collected nationwide, which permits the integration of all datasets into a true network.
- move away from .shp!
- A standard way to update and maintain complete, accurate, and readily accessible AT network data
- Nationwide non-road infrastructure standards.
- ISO/ANSI/APTA and other SDOs are too closed. Need open standards and support for them from feds.
- Perhaps provided in tiered levels of complexity.
- Active Transportation Specification (ATS), the global, de facto open standard for bike, pedestrian, and accessibility infrastructure data.
- best possible outcomes are standardizing the data and the language we're using to describe facilities. Also getting more people walking/cycling/access transit in safe, comfortable locations!
- standards, regulated workflows that continue to feed walking, biking, trail and rolling datasets that can be used for network analysis, routing, accessibility, and tracking metrics
- Standard for measuring attributes / features in the network
- agreed, network standard spec, also how different networks interconnect
- standardized format
- Create a standard definition on terms, minimum inputs & timeline for phased results
- building a baseline quality for measuring conditions for the infrastructures
- Standardized data elements. Open-source tools for better data exchange or conversion (if have to).
- Shared understanding of primary infrastructure types/standard for what counts and what doesn't

Develop End Products

Publicly Accessible Data Covering the Nation

- Data coverage for *everywhere* in the country within 5 years.
- Ped/bike transportation layer available nationally (consistent and standardized)
- National/state/regional routable network that tracks existing & planned system with data content updated frequently by a combo of authoritative contributors & advocates
- Standardized and routable data for public trip planning
- A comprehensive and interoperable dataset of pedestrian network data.
- We have full PROWAG compliance data maps for all sidewalks everywhere in the country!

- Usable data that can be used for multiple purposes that directly increases pedestrian access for all people with disabilities to multimodal transportation
- A "living" and sustainable map of Bed/Bike Infrastructure via Public/Private partnership
- The network data would be easily accessible even to non-technicians. E.g. public health and policy makers who don't have engineering and planning training.
- Produce a routable pedestrian network across the US (that's actually correct and updated)
- "walking" overlay in google maps and a better "bicycling" layer
- best possible outcomes: A publicly available national sidewalk GIS layer. Or at least a nationally consistent measure of sidewalk availability. you know, easy!
- A national network of ped/bike/accessibility data. It doesn't need to be perfect but at least at the same quality level as the network for cars.
- The dream: An almost live digital twin of pedestrian and cycling network infrastructure
- OSM is just as complete for sidewalks and bike lanes as it is for roads.
- The minimum viable "product" for different types of applications

Data Production and Consumption Tools

- more efficient, effective, and available tools to enable even small communities to tackle mapping AT infrastructure
- A single hub to find and utilize the pedestrian data by the thousands of organizations creating the data

Adjacent or Derivative Data

- Data on desire paths as well, not just existing facilities
- Best possible outcome includes data that is: -supply and demand data, -system wide, -includes intersection delay, and - curbside and operational issues
- exposure data not just inventory
- Getting reliable and robust count data and methodologies for pedestrians and cyclists that are easy to integrate into existing map applications.

Clarify Data Governance

- ISO committee on bicycle, pedestrian data
- These are low resource data - efforts around maintenance and updates is often not a single entity, but requires cogoverning/collaboration - BIG difference from GTFS
- Allow integration with OSM
- guidance for maintaining/streamlining the detailed level of information needed to do small scale analysis for walking and biking
- Temporal change in where resources to update/maintain data lie is a huge challenge; OSM has been good, but doesn't allow for federated data
- A data model that leverages other nationally available transportation data assets
- In addition to OSM, need to coordinate with Overture, their schema, ID system, etc.
- Top-down approaches will never equal the crowd-sourced up-to-dateness of OSM - but OSM is inconsistently coded. i.e. is a sidewalk a separate way or part of st?
- Data is in OSM and we shouldn't duplicate it...but how do we make it useful and also have a validated version.

- OSM license. OK for some things, but not open to others. Not clear how PDM gets data back into OSM.

Change Policies to Support Data Collection and Maintenance

- Every state, city, and county cares about gathering this data AND learns it's possible.
- No excuse at local, regional, state, national scale for understanding needs for access on ped/bike/roll
- facilitation of crowdsourcing for smaller, under-resourced places -- have people help get them "on the map" not just mapping projects of "significance"
- Cities move away from being afraid of knowing whether their infrastructure is compliant to wanting to know.
- no more excuses for agencies who have not addressed their ADA Transition Plans!
- requirement for gov't agencies to collect and maintain such data (and funding to support such effort.)
- policies around asset management that include biking and walking infrastructure
- Funding for cities to regularly collect this data
- getting walk/bike/roll data to equal status as motor vehicle data is a worthy goal.
- should be required for accessing any funds is to map sidewalk, bike and rolling infrastructure with all right of ways

Clarify Data Collection Methodologies

- Automation to allow regularly updated walk.bike.roll infra data -- not just one-time collection, but persistent, frequent data
- Identification of simple data collection methods and standardize collected pedestrian/accessibility format and data
- Is there a review of how this data can be collected?
- Widespread citizen engagement with the data. Where a significant portion of the population actively update the data themselves
- Data democracy through OSM. Empowering communities to collect the data they need to improve their access.
- Assumption - have we done an inventory of different methods for verifying what infrastructure is along streetscapes (e.g., satellite imagery)?
- Having not only a list of available data sources - but the pros/cons of each, and what is the minimum info needed to start. Example to consider below

Expanding Data Options & Insights – No “Silver Bullet”

	Coverage & Refresh Rate	Positional Accuracy & Ground Truthing	Data Repeatability; Consistent Quality	Low Cost per Mile	
Satellite Imagery	7	1	4	7	Good for broad roadway network overview info
Aerial Mapping	6	6	6	5	Expanding use of AI/ML on high resolution imagery for inventories, conditions, safety
Mobile Mapping	2	7	7	1	Ideal for engineering survey
Photologging	3	5	5	3	Good for historical records, and specific area recall
Fleet & Dashcam Data	4	3	3	4	Growing uses for street level AI/ML insights
OEM Connected Vehicle Data	5	2	2	6	Good crowdsourced telematics info for driver behaviors & safety
Manual Field Collection	1	4	1	2	Traditional approach for project specific data collections per a user spec

* Force ranking method by category

Realize Downstream Social, Environmental, Safety, Health, Cultural Benefits

- A safety improvement for all streets. Vulnerable Road Users are protected everywhere.
- Less mental energy needed to plan a bike route - mental energy is real energy, and people give up and choose another mode.
- An interconnected route from the east coast to the west coast.
- More accessible data that increases use of built environment and active transportation data by health researchers
- There're no more ADA lawsuits because all sidewalks are compliant.
- Acknowledgement/cultural acceptance that sidewalks MATTER!
- Filling in existing gaps and having a more complete network
- Make active transportation a viable and safe option across the board all over the country

End Products Fulfill Specific Use Cases

- Network data would allow an understanding of the actual scope of network needs. There are probably tens of billions in network gaps that we don't have quantified in any way
- to gauge how much progress has been made/how much work is left on making public rights of way meet ADA requirements
- measuring LOS for pedestrian and bike versus vehicular movement / accessibility is conceptually unique if not even divergent
- My comment here: I need infrastructure data available for ped/bike safety analysis
 - We have high resolution imagery and ped/bike feature extractions available across the country on current data - so glad to help you immediately on current/planned projects if it meets your needs
- Cities better using this data to plan for and implement more accessible communities.
- improve planning for and implementation of active transportation and complete streets. Evaluate accessibility and assessment of multimodal routing. Reduce Level of Traffic Tress (LTS), reduce VMT, and improve public health outcomes

----End of question

How does your work help other organizations? Or, how does the work of other organizations help you?

Data Producer

- State provides authoritative data for bicycle planning efforts
- Metropolitan Planning organizations lead the planning of AT network in urban areas, to do this work, we prefer to _use_ local data, but we are the AT network mappers of last resort.
- Sponsors use data my organization generates in safe systems analysis, and we use data to estimate volumes and to identify infrastructure for research projects.
- as researchers, we sometimes collect infrastructure data as part of the inputs needed to answer a question - these data are likely not uniformly formatted across research projects but could be a wealth of data that could be used by others when pulling disparate pieces together to build a bigger dataset.
- The Bicycle Friendly Community program requires bike network reporting based on the speed limit of the roadway and several bike facility types. We're happy to share that data – League of American Bicyclists
- At the MPO level, we build the base and allow others to expand upon it, or people can simply take what's been created to support Active Transportation Projects.
- Looking to assist others with improving data collection and data integration through new technologies practices.
- Mappable data that can be used and overlapped with State and Local Agencies safety, planning, and project maps

Data Consumer

- Consolidate and process data from varying sources, quality, and structures to help answer questions that agencies have to understand the state of their AT network
- Think more about data users; local decision-makers are critical in delivery of both the infrastructure and data; many may not have capacity for highly technical tools
- we use a variety of data and mapping sources to inform our community partners' planning processes
- Other people's data collection helps understanding of good, better, and even better
- Measure city progress towards building better bike networks; connect data to policy decisions and advocacy resources
- Data consumers as important as data producers
- We use network data to evaluate access to destinations annually, showing how access evolves in response to transport and land use changes
- Let USE drive standards, not the other way
- The research we support provides the evidence base for public health recommendations about cancer prevention and health promotion

Data Enabler

- Created two open-source tools: Tile2Net: to map sidewalk networks from aerial imagery and CitySurfaces: classifying sidewalk surface materials
- I developed two open-source tools, Tile2Net to map sidewalks, footpaths and crossings from aerial imagery and CitySurfaces to classify surface materials
- how our work helps: I think CDC is a good convener. we previously (~2018-2021) convened a community of practice around automated image analysis. I like to think it helped foster advances in this area
- Working on how to dogfood OSM within government. Spending gov't resources on adding data to it and then using it.
- Help communities get the federal money they deserve
- We need users to test our specification and what works well about it and what doesn't work.
- We try to illustrate the art of the possible (technologically) to agencies who are unaware of new possibilities.
- Helps people collecting data understand the difference between good quality data and bad quality data. Output is only as good as the data collected.
- AMPO has the ability to share info with hundreds of MPOs across the U.S. via our webinars, newsletters, conferences, etc., and we would welcome the opportunity to bring together MPOs on these issues!
- OSM's bike/ped data model has become a global standard through local consensus and should not be overlooked. May orgs use it already: PfB, AllTrails, Strava, Garmin, etc.
- Federal govt can establish standards through regulation and guidance, has some influence on reauthorization that can include statutory requirements for reporting.
- Working on creating good practices for open standard development and maintenance.
- The League of American Bicyclists often promotes data practices - and it'd be great if we can promote a data standard that is potentially universal
- Creating open standards for data like archival transit operations (TIDES)
- We provide the nation's leading sidewalk and bike path compliance software, so we could help states and cities manage these assets.
- ISO TC 204 would like to standardize a set of attributes to support different public right of way infrastructure
- Cloud.gov?

Misc

- Information is located in pieces over many different places. It only becomes Data when it is organized and stored in a format that allows analysis.
- Collecting information and even more maintaining it is a huge task that would overwhelm any particular entity. Only way to manage this task is by splitting the effort.
- HEPGIS and its STEAP Tool starts to identify where bike/ped connections should be when connecting to underserved communities
- Our Region AT Plans utilize broad collaboration and help launch individual community plans and position them better for grants

- We try to influence policy makers at the local level and regional levels and believe it's critical to understand how they are making decisions which have a huge influence the reality of ped, bike & transit networks.
- Planning department can share info with other stakeholders and inform future priorities. Could use ways for more direct info sharing with other agencies

----End of question

What questions or uncertainties do you have in your work on - or the state of - these data?

Misc

- How different jurisdictions define ownership of sidewalks. Homeowner, municipality, etc...
- Longevity of current practice is of major concern!
- Jorge Luis Borges-inspired concern about maps that grow to overwhelm their subject -- we need to create tools, not monsters that eat resources
- What he said for making decisions for project decisions at the local level, helping them to make the best decisions that improve the networks, and grant requests, but data tolls also policy/decision makers at US DOT and State DOTs!

Use Cases

- Need to find use cases for data to be used within agency that is responsible for producing it - otherwise they won't be incentivized to make it good. The best data is used data.
- What does consumer demand look like? Types of consumers, use cases, ...

Data Findability

- It's not at all clear to the neophyte where to go to find curated summaries of available data and

Data Producibility

- Barrier to entry needs to be low, but scalable.
- Local communities cannot afford the data collection/processing/management/update.
- What is the minimum viable product for ped/bike/roll data schema - how do we determine what's "good enough" to facilitate decision-making
- Can we make minimum inventory requirements that are achievable while allowing users to provide highly detailed data (e.g. condition
- some stakeholders have higher levels of demand for the data and ability to produce, differences in data production capacity
- The needs at the National, State and Locals levels are different - so the group should think about how to satisfy a minimum set of requirements for each. Have those minimums been established?
- Could we imagine an approach where the perfect is not the enemy of the good? Could we develop a first cut that provides a rudimentary network inventory fairly quickly, and then add layers of detail over time? The goal would be to get at least fundamental data online and available quickly.

- That's been exactly the guiding principle in OpenSidewalks (as mentioned, a low barrier to entry, but still routable and use-driven)

Funding

- even if we know what the need is we still have NO RATIONAL FUNDING MECHANISM for sidewalk construction and maintenance
- It is expensive to create this data (you need aerial imagery companies to fly the regions then you need someone to spend time to digitize all of this information). If we want to know where all these pedestrian and bicycle assets are, we need to recognize these economics and try to team up amongst agencies to fund its accurate extraction and maintenance so we can make serious headway on these goals
- How can more funding go towards data collection? how can state and federal agencies require data collection on a regular basis
- Many local agencies will not/cannot collect unless required and funding available to support - is this something that must be tackled legislatively at the federal and/or state level?

Status of Standardization

- is there a standard that we should direct communities doing sidewalk inventories to?
- My colleagues in the FHWA Office of Policy, with Oak Ridge Nat'l Lab, developed a National Bikeway Network geodatabase. <https://nmtdev.ornl.gov/#/> We created a data template for bikeway types that is hopefully a good start in defining facilities https://nmtdev.ornl.gov/assets/templates/NBN_DataTemplates_final.pdf

Data Archiving

- Need more before/after data: taking data at regular BL for crashes and ADT, then after it is improved to a PBL, take data again to see if ADT has increased and crashes decrease
- In addition to updating datasets regularly, we need to keep a record of changes in the infrastructure, so we can do before/after safety analysis. Only knowing current conditions isn't enough for our research needs. (but it would still be a huge leap forward!)

Schema Details

- Details of access across bike facilities and interaction with pedestrian and accessibility infrastructure matter
- How do we evolve a standard data framework given that the actual standards for what counts as good infrastructure are also evolving?
- Bike facilities have changed significantly over the last decade, and we still don't have an AASHTO Guide with protected bike lanes
- placement, angle, condition, etc leading to challenges in reproduction and ground truthing
- Sidewalk slope is highly variable across existing sidewalk facilities, depending on level
- Do we need to have separate models for dense urban areas vs. lower density suburban areas?
- Even with something like a separated bike lane, there can be lots of variations in how separation is done (flexible bollard, curb, flowerpots) and it's not clear which variations matter

Interoperability and Integration

- How well interoperability between datasets occurs. Ability to match OSM > GTFS > Overture > etc > etc.
- Connections/routing between various modal networks
- Sidewalk data is so needed but is collected by local agencies in so many different ways and their needs are diverse. Some agencies want data at the centerline level, others want individual linework for each sidewalk. How to provide both without duplicating effort?

Data Quality and Maintenance

- How to establish persistent sources of data at a network-scale, including multiple infra owner/operators and private landowners (public space/pathways)
- How to keep the data up to date? Bike/ped/accessibility data change with high frequency in many areas
- Need data reconciliation based on different needs. Git for data.
- How to maintain and update really detailed networks and database in the most efficient and collaborative ways
- How to best leverage latest GIS tech to achieve fast, valid, truly collaborative AT dataset updates (new facilities, facility changes) that leverage a diverse set of contributors
- How to describe and publish (semi-)dynamic data for bike and pedestrian infrastructure
- Data currency. Data maintenance is an issue
- being able to measure quality and completeness of data
- Uncertainty is that the data is severely lacking and how we keep it up to date -- I think it as the infrastructure is changed - the funding sources themselves should require that the data be updated
- A lot of data is incomplete with many gaps - especially when working across multiple jurisdictions, but also working in the same municipality.
- rural/urban differences in data quality

Political Will and Policy

- Will FHWA ever require states to inventory their non-motorized networks (with full ADA compliance, not just location)?
- How do we deal with states/cities who don't care about this data?
- willingness of local agencies including counties to be responsible for ongoing data collection and verification
- Concern: The policy complications we're talking about are also **causes** of the current lack of data, and I fear sometimes that we won't get data until some policies change. e.g. We may need state/national mandates/standards for presence of sidewalk, and move away from private stewardship models, in order to really spur sidewalk data creation to demonstrate compliance. and a lesson in this for data analysts: we can't claim the data will solve our problems. The sidewalks will solve the problems, and we need to lead with that.

Licensing

- Licensing concerns and warns. How to make contributions the most useful without getting lawyers involved or having fear of lawyers getting involved.

- want to use OSM. hard to understand how to use PDM right now to create a "validated" version of it with more flex license. How is it resolved with OSM proper?
- How to make sure licensing does not hinder use of data. Can we make sure contributors can contribute and users can use without fear of a lawyer suing them?
- Plus, there are significant license issues associated with deriving new data from existing proprietary image/video/map data. Universities cannot violate user agreements.

Data Sources

- uncertainties - will we ever find a source of images that will permit us to create a freely available data product?
- How were these data collected? What is the source?
- Montgomery county just put in a sidewalk in front of my house, but the Google street view images of our house are over 5 years old - so my questions are about how up to date are various data
 - Many states and counties now have access to fresh, high-resolution imagery that ranges from 3 months to 12 months old. This is a paid service for higher resolution, mapping grade, current imagery across the USA
- Uncertainties - Will competition among big tech to be the leading provider of pedestrian wayfinding hinder our ability to partner with them? (assuming we will eventually need access to something like google, bing, or apple images images). If that is not possible, what % completeness is possible through crowdsourcing (e.g. OSM)

Authoritativeness

- good point now on governance/authoritativeness

Data governance

- General "where do we go from here and who specifically makes it happen?"
- how to "herd the cats" - with so many different agencies and organizations that may have a stake in collecting, updating, managing, and using these data, who decides which data to require for inclusion in a national dataset, what format they should be in, and how it should be funded?
- How can we collaborate and learn from similar efforts in other parts of the world?
- How to ensure any standards established will continue to be used across the country (urban/rural) and into the future without falling by the wayside?
- Who would be the governing body for a standard developed in this area?
- Who should be tasked with consolidating this data from other jurisdictions, and to what level of granularity -- counties, MPOs, state DOTs, federal, other orgs, all of the above?

Role of OSM

- Can OSM be relied upon for products that are expected to be authoritative?
- OSM data model problematic - IDs change. Need to move towards something like overture stuffs.
- OSM is 100% also under resourced to lead that collaboration of mapping across the nation
- OSM integration does not mean 100% OSM
- OSM can be a consumer (one of many), rather than a repository for this data.

- I'd love for more govts to be on OSM. It is also important to keep that data in databases the gov can control, but contributing it directly or making it available in an OSM standard way is welcome
- OSM for bicycle infrastructure data across multiple jurisdictions has been a huge help. It doesn't have everything we need, but it does provide some consistency. It's also being used by PeopleForBikes who is encouraging local jurisdictions to upload data to OSM to improve their rating
- Even in OSM, there are no guidelines to encode sidewalk data as well as lots of custom tags. Having a best practices approach would be great!
 - Not sure what you mean but there are guidelines and tagging rules - if you haven't had the chance, the OSM wiki is quite comprehensive
<https://wiki.openstreetmap.org/wiki/Key:sidewalk>
 - The tags are missing accessibility (ADA) attributes.

----End of question

What do you take as a "given" about the state of these data?

Lack of standardization

- Nothing's standard
- No standards in place
- lack of standards
- As a "given" we can assume data are not accurate, complete, or built to a national standard

Poor quality data

- The current state is bad (if existing) most places
- START OVER
- super messy, inconsistent, non-standard, gappy
- Out of date
- Many sets are subjective
- Quality of data reflects resources of maintainer and/or their political priorities for transportation.
- Data needs a lot of clean-up in order to work with.
- The definition of "good" data varies significantly
- problems with utility -- i.e. are segments by property or block? can the local detail be captured at a fine enough grain?
- accuracy varies greatly

Data gap

- Lack of data
- Incomplete
- Data gap
- Insufficient level of consistent, trustworthy data for understanding accessibility.
- Incompleteness, inaccurate, and inconsistent where it exists.
- Infrastructure is inequitable, but we can't quantify it that in many places

- That it is very incomplete nationally, and inconsistent.
- givens: inconsistent, incomplete, establishing a data standard would be a great first step

Barriers are non-technological

- There is not funding for data creation and upkeep
- It will be politically fraught in many places.
- labor intensive
- Agencies are happy with lack of data because it means they don't have to address network gaps (can claim ignorance)
- This came up in our small group, but one of the "givens" is that sometimes local governments do not want data about the accessibility of their networks. They believe -- rightly or wrongly -- that they have greater liability if someone trips and falls on a broken sidewalk if they had data about it. This willingness to bury their heads in the sand is a barrier to overcome.
- A given: It's 100% technologically possible to reliably collect all this data. The challenges are in resources, institutional barriers, etc.
 - You are correct - it is possible and in fact we have 100% of the US with either 6 inch or 3-inch mapping grade aerial imagery with feature extractions ranging from 3 months old to 18 months old - but it is not a free public service - but it is extremely cost effective compared to custom collections or patchwork info
 - I think this is where we have to contemplate, what is the actual end goal here? I believe it is having access to this data to best plan our cities to be able to incorporate these different modalities. To develop the infrastructure, citizens aren't the ones who need this data, it's those who will build this system - the MPOs, the Municipalities, the States (to allocate budgets).
 - Then technology companies will be able to track the actual usage/give you these routes once people start moving around on the assets (which solves the problem of making it so the public citizens can safely utilize these routes).

Ground truth is in flux

- It will never be 100% accurate ... infrastructure (and its quality) changes too fast!
- Data content is changing fast; best use cases are end user needs (incl. LoTS) & planners' needs for prioritization; best potential contributors are closest to the area being mapped.
- It will need to be maintained indefinitely as infrastructure evolves over time.
- a given: it's out of date as soon as its collected
- The format/dataset needs to be flexible enough to allow for adding new or innovative features not yet standardized as infrastructure - e.g., separated bike lanes (and the type of separation), tactile walking surface indicators, quick-build features, floating bus islands - these are all only found in very progressive cities, and engineers are constantly evolving infrastructure and facilities to improve transportation of bicyclists and pedestrians (and micromobility, too!!)
- ever-changing

Inequitable data across modes

- Mostly focuses on Bike infrastructure rather than peds and accessibility
- FAR far behind what is available for driving

- Unconscious Bias
- considered second-class information by most agencies - "nice to have" but not a priority (and hard to collect)
- A given: our cultural obsession with driving causes ignorance about the importance of sidewalk data, and we need to disrupt that obsession at many levels.

Inequitable data across geography

- Availability of data is representative of big inequities: some areas will be able to build these data, others will not
- Urban/rural divide is real

Misc

- isolated when it should be interconnected (e.g. with streets, trees, stormwater)
- that if you build it (more bike/ped facilities) then they will come (bike/walk) more
- Data to empower local decisions.
- Safe facilities for biking, walking, and accessibility matters less than pavement quality
- Data is outputted in WGS84 coordinate system.
- There's been a lot of progress - and a lot more people working in this space over the last 20 years
- Whom you should really ask is the public. Their expectation is different from reality, but it matters.
- One approach to collection doesn't seem to work - satellite imagery, aerial imagery, street-level imagery, crowdsourcing, gov authoritative: lots of approaches + collab
- it's hard for non-cognoscenti to find and use
- Needing to be comfortable with some level of data that might not be perfect but would be comprehensive
- Could we potentially have X# levels of data like other systems?
 - Level 1 - minimum set of critical elements
 - Level 2 - level 1 plus additional, important elements
 - Level 3 - levels 1-2 plus nice-to-have
 - ...Etc?
- I can't think of anything that's a "given" about this data.
- In the US - NAIP is a resource in many states (much better than satellite for this purpose). The street level data being collected via Lidar and photogrammetry also holds enormous promise - but very costly
- Data needs to eventually include vision and planning documents for both Land Use and Transportation, so communities can see the vision of what a fully built out network looks like and the incremental progress of solving problems and improving the system one project at a time!

----End of question

What knowledge, expertise, or experiences are necessary for a successful collaboration?

Front-line staff and experience

- Public works staff, construction contractors, city engineers, etc. that are on the front lines of making the improvements we are striving for
- on the ground, real world experience with ground truthing sidewalks on the part of the data wranglers, too

Planners

- planning perspective to incorporate aspiration, not just description
- How performance-based planning can require/employ data - use that to influence what/how data to target.
- A strong Statistics background with a knowledge of: time series, seasonal adjustment, outliers, bias, and forecasting.

Data producers

- people responsible for creating/maintaining data
- people responsible for the business processes that would ensure the data is made
- An attitude that eventually this should be part of the same business processes that maintain motor vehicle infra data. AT infra is real infra and it shouldn't be a volunteer effort.
- Asset management, data management staff
- Since these data are constantly changing, it's not just who will create and aggregate the data, but who and how will it be continuously updated? And how will the record of past changes/upgrades be stored?

Data consumers

- Emerging technologies that rely on the data - e.g. AV providers.
- vendors who can help make products on top of data

End users

- Also, disability experts and advocates, independent living groups,
- there are two types of end users: developers of apps and people who need the data for mobility purposes
- What data attributes do different groups need to be able travel.
- To understand the data needed, we need to connect two groups: users who use the data and producers who generate the data
- End users - how do pedestrians actually use/how are they impacted by the data that has been uploaded, translated, and distributed?
- centering the voices of those affected most by the data
- Looking at Rural challenges with AT
- knowledge, expertise, experiences: end user needs and expectations. How will a safety researcher use the data? how will a city councilperson? a cardiovascular disease researcher?

- Awareness of health research expectations for causal inference about relationships between environment and behavior
- Data users and producers

Data Standardization

- Agreement on data models. An MVP data model is key (say no 2 kitchen sink). Technology platforms that make contributing easy. Deliverable end products well defined
- A thorough definitions document for the standard, so everyone is clear on the attributes/domains
- We utilize a Ped-Bike Terminology document to "speak" the same language
 - <https://www.michigan.gov/-/media/Project/Websites/MDOT/Travel/Safety/Road-User/Bicycling/Planning/Bicycle-Pedestrian-Terminology-Booklet.pdf?rev=7a59be762dfd4a36b52241978029a968>
 - We also use a standard geographic framework for all data collection even by different agencies
- Flexible, extensible, data schemas that are use-driven
- A clear inventory of infrastructure data types and barriers to collection that can be communicated to decision-makers in order to get support and resources to build out what is most useful.

Collaborative data governance

- third-party with a white hat that exists in perpetuity to manage the open standard (see interoperablemobility.org definition of open standard)
- If specs will be developed, look into the governance of successful and similar collaborations like GTFS, GBFS and MDS.
- Open-source development expertise. Community facilitation.
- TheODI.org
- interoperablemobility.org coalition
- lessons learned from GTFS community
- For successful collaboration - a proper Public/Private Partnership Program should be established to ensure viable participation from leading industry providers to leverage technologies and methods already proven in other markets
- Understanding the merits and limitations of the whole data pipeline - Data collection, maintenance, dissemination, and usage applications
- A flexible roadmap

Integrated Data

- integration of information and knowledge about trees
- Transit infrastructure relationship to bicycle, pedestrian, accessibility infrastructure
- Current collectors of roadway data. So much of this data HAS to be combined with roadway data to lead to insights, need to have them involved.

Legal issues

- How to avoid being sued for contributing or using data. I don't want to spend time analyzing licenses and learning to think like a lawyer

Funding

- people who can support business models that fund the data maintenance as well as the open standard that is used
- Funding, whether from state agencies, Congress, or other sources to facilitate the collaboration and pay for eventual data collection and maintenance
- Funding mechanism to support the data generation and application.
- DOTs can use SPR funding for AT Planning including data collection. Very Competitive demand for funds
- How will this work be funded now and into to the future (sustainably)?

Interdisciplinary and multi-level expertise

- involvement at various levels of government
- need a mix of background including policy makers, governments, local residents, data users, data/app designers/builders, etc.
- Suspect we will naturally reach out to planning, infrastructure, GIS, public works, engineering expertise. Let's not overlook (don't mean to beat a dead horse) expertise in public health, social justice and community organizing, public policy, local community organizations

Misc

- Consider how US default to auto-mobility was influenced over decades, use as element of roadmap to "making CS the default approach"
- A human perspective on making informed decisions.

---- End of question

What is the purpose of bike, pedestrian, and accessibility infrastructure data? How will you use it?

ADA compliance and physical accessibility

- ADA Compliance
- To support pedestrian accessibility efforts at the municipal level
- ADA Transition Tracking
- Assist with stewardship and oversight of the ADA. Track changes (improvements) in accessibility over time.
- Understand compliance with ADA/ other A11y laws and what work needs to be done/prioritized - sidewalk width/condition, APS, etc.

Safety

- Help people use bikes / walks safely
- When agencies say "safety first" this data would help us hold them accountable
- Improve safety, security, reliability for users of buses, rideshare, AVs who are blind/use wheelchairs, especially in unfamiliar settings and travelling alone
- Safety and Infrastructure Planning
- What data will be most helpful in saving lives?

- I will use it for safety analysis
- VRU analysis; network analysis; crash reduction factors; planning; project selection; crash rates by exposure...
- Perhaps most importantly, we need the data to help us arrest the striking burden of pedestrian fatalities!
- For safety studies, we need to know past conditions as well as current conditions. When was the sidewalk added? is important too

Disaster management

- emergency evacuation route planning/use

Planning

- Knowing what infrastructure is located where is the first step to improving the networks and help with improving active transportation
- helps identify deficiencies in the existing and planned networks (ie looking at unmet needs) and evaluate equity
- transportation connectivity for all levels of the public, fill in the gaps over time, nationwide publicly available data
- Mode shift trip planning
- To know how much there is, what condition it's in, and where it isn't -- allows for planning for repair, new construction, and expanding the network -- guide spending
- To better understand the current built environment and how it can be expanded and improved upon.
- One purpose is to allow evaluation of new/old infrastructures influence on behavior - this can support policy initiatives
- Project Prioritization and community needs.
- Purpose of the data: First, to help spend limited bike/ped infrastructure \$ more efficiently. (e.g. overlay pedestrian injuries and sidewalks, fix the "hotspots" first)
- Pg. 9: asset management, planning for future projects, for safety analyses, travel demand modeling, determining a route to use if I want to bike or walk from point A to point B based on my physical abilities
- Asset management and maintenance
- To help cities understand how they can be more accessible to pedestrians with disabilities and where improvements are needed
- As a start, FHWA needs to measure outputs of the fed aid highway program investment in ped/bike facilities
- To plan, design, analyze, and navigate the world from a ped/bike perspective, instead of a car's perspective. This is critical for making a human-centered built environment.

Navigation

- To give users better tools for understanding how to navigate the public right of way safely and efficiently.
- Better navigation technology for the public
- Asset management, and navigation.

- Making cities that enable people with various impairments to be more independent in their route planning and exploring cities
- Multimodal trip planning for various user personas with different physical abilities.
- Multimodal trip planning for users with differing mobility abilities.
- To improve routing & accessibility in major cities

Research and analysis

- Matching usage/counts to infrastructure
- For a basemap for modeling bicycle and pedestrian flows
- Network gaps analysis
- Accessibility Analysis
- Understand inequality in bike, pedestrian infrastructure
- the ability to have exposure data for pedestrians and bicyclists open up a whole world of predicting safety outcomes to assess safety performance before we plan, design, and build infrastructure
- multimodal travel modeling
- Evaluate progress towards goals, objectives, and metrics.
- Would use in statewide multimodal time-to-destination analysis.
- Research to find the patterns of inequality in infrastructure availability and condition
- Would use to create multimodal isochrones and downstream analysis.
- To complement pedestrian and bicycle traffic volume database development.
- It is the foundation for all VRUs related research, just like the map data for vehicular research. Safety, accessibility, health ...
- Also, ID areas that have lots of places that people might walk to (stores, libraries, etc...) but no sidewalks. It is like IDing "latent demand" for walking.

Motivating policy change

- How can data analysts, etc., focus attention on needed policy and funding solutions?
- Must be used to influence policy makers - think local city councils and planning boards - in setting local capital infrastructure priorities, and mundane but HUGELY IMPACTFUL policies such as local zoning ordinances, subdivision and development guidelines, roadway design guidelines, school siting decisions. Not very sexy stuff, but huge impact on access of local residents, and resulting mode split.
- Justification for building.
- Motivate political change to improve and invest in transportation
- Compare states, cities, and counties publicly so that places are encouraged to strive for being the best places for biking
- Justify funding needs to public officials with the capacity to direct funding to safe infrastructure
- to argue for needed but absent funding and illustrate the scale of the need -- DOT has said that they can't take on sidewalks as part of transpo network b/c too costly...!
- Help agencies see that bike, pedestrian, and accessibility needs are massive and provide more transformative benefits than another roadway or highway expansion
- very locally, to encourage my city to put in crosswalks
- Purpose - build better cities, towns and places for people

- Numerous uses but specifically: demonstrate that non-drivers are systematically and universally provided far less access than drivers, due to policy choices.

Misc

- Are folks aware of the National Bikeway Network Data Portal? <https://nmtdev.ornl.gov/#/>
- More tools for local jurisdictions
- Achieve industry consensus on infrastructure data standards
- We need to develop use cases and requirements to determine the purpose of datasets that profile the purpose. There isn't one size fits all
- Sharing back to e.g., e-scooter operators and cargo bike fleets
- Unless it was a typo, COU might mean context of use

---- End of question

True collaborations share resources. How do you think you might contribute?

Can you contribute expertise?

- MnDOT created a Bikeways data standard we can share with the group.
- OSM editing experience. Previously PFB editor for my region.
- We have 10 years' experience doing national-scale bike, walk, and transit routing on OSM and GTFS (UMN)
- The FHWA TMG covers portable and permanent micromobility counting techniques. Our HPPI-30 office can help with this.
- NIH: 'Sweat' equity as a work group member who can share about the needs/wants of the health research sector but doubt if NIH would ever contribute money
- OSM US is here to support the convening community / stakeholders from all sectors to find solutions. In addition to our government working group, we also host a monthly private sector collaborator sync
- Direct research towards gaps.
- knowledge about methods to create and inventory the data, data uses for planning and public health (relationships between built environment and desired outcomes), including accessibility analyses. Workflows for data maintenance
- There is the Talking Traffic webinar that our office hosts that has done webinars on micromobility traffic counting.
- US Access Board We can help with accessibility issues, but we generally don't collect a lot of Data

Can you contribute relevant experience?

- Forming a Pooled Fund Technical Advisory Committee (PF TAC). (FHWA)
- (UMass) - Glad to share update about the sidewalk mapping work I am doing with two state DOTs. LiDAR mapping experience for 10+ years.

- I would be happy to share the non-motorized infrastructure asset management system (Citian's ADAPT) we've built to illustrate what's possible to those less aware.
- Utah has a basic data model for on street and off-street AT facilities that might be a good straw man for starting point data model conversations.
- Open standards development and implementation processes (MobilityData)
- yes. with GTFS, TIDES, ODS, OSM, interoperablemobility.org etc.
- International coordination (MobilityData)
- Data standard creation process, discussions, etc.
- (Toole Design): Experience with data wrangling and analytical applications. Can help advise on what works or does not for different applications
- can contribute my past experience in developing NCDOT's Pedestrian and Bicycle Infrastructure Network, and how they attempt to maintain these data
 - I can also help connect y'all with the NaTMEC - National Traffic Monitoring and Expo Conference, happening in June 2024. It could be really helpful to present on this there. The presentations are currently being slotted, so now is a good time to see if we can get this on the agenda somehow.
- I am willing to contribute expertise in using computer vision in data collection and also in using infrastructure data in planning and safety analysis. I would like to collaborate on projects in this effort.
- OSM US can also facilitate / improve understanding of working with the millions of data contributors across the US (to a degree!)

Can you take on a leadership role?

- Yes, willing and interested to contribute time as needed
- I made all my models and codes open-source and happy to help scaling it up and improving on them to make them more generalizable
- TCAT is 100% invested. Assign us a role!

Can you provide administrative support?

- Totally can provide 'lessons learned' from our experience(s) - MDOT
- Organizing data collection workshops (FHWA)
- Database development
- The TRB Bicycle and Pedestrian Data Subcommittee is very interested in this, and can host discussion webinars as part of our Conversations with Colleagues
- The Pedestrian and Bicycle Information Center (PBIC) can help get the word out about this work through our website, email lists, and webinars.
- Sharing with various disability networks to ensure data standards are capturing lived experiences and needs
- AFB - happy to participate; can connect with the disability community.
- Use and training on Project Sidewalk - projectsidewalk.org
- I can help connect standard development organizations that are working on standards and end use applications
- Contribute - Linking US DOT modes and OST on broader goals and activities. (The [DOT FY 2022-2026 Strategic Plan](#) calls for an increase in the percentage of person trips by transit and active

transportation modes by 50% from 2020 levels, and it is essential to ensure these trips are safe—especially amidst troubling safety trends for pedestrians and bicyclists.)

- I am:
 - Interested in helping bring the public health community and expertise (such as significant surveillance data on areas of high health risk) explicitly into this process.
 - Want to be sure that the products of this work can impact local decision- and policymakers, as they are so often the targets of our efforts
- contribute: I think CDC/Phys Act Branch would be excellent at convening experts and end users from the health sector. If we end up having a subgroup around health, I think we can play a leadership role if needed/desired
- We're happy to share the data structures that have worked well across States/MPOs where we've developed these networks!
- Contribute - collaborative working relationships with a variety of federal and state agencies

Can you enter formal engagements, such as MOUs?

- The League of American Bicyclists is happy to share its experience and data from the Bicycle Friendly America programs (and advocate for funding data)
- Promote and communicate working group needs & priorities; sharing any tech we've developed; general admin support – PeopleForBikes
- Vexcel is willing to contribute time, imagery, AI/ML extractions and geospatial experience to help validate certain solution options from nationwide aerial imagery services

How much time can you commit (hours per month)?

- Couple hrs/mo w/out extra resources; Much more with.
- Happy to lend expertise as needed. (SPC)

Funding and data collection tools

- I am happy to help in any capacity. I can help in data creation and analysis, using computer vision and machine learning as well as standard econometric modeling
- In PA we need this data and are mapping it when possible now. Will continue and would love to both share experience & get guidance regularly. PA Downtown Ctr
- Meta
- (meta) - help organize data creation (in OSM), community engagement/outreach, data usage and integration, lead/participate in working group(s)
- If you all tell me what FHWA can do, I'll work to get it funded.
- I can help infrastructure inventory data collection with computer vision. I am interested in committee meeting for standards.
- Can contribute national datasets of built natural and social environment data developed for Robert Wood Johnson Foundation with user portal from Urban Design 4 Health Inc
- I can help in data collection using computer vision (Tile2Net is already published and opensource) as well as data analysis and modeling.

QA/QC

- Might be able to analyze and flag areas where data is lacking (especially in CA). - Caltrans
- Happy to help however possible, but time would be scaled with resources available (for everyone!)
- Building a pedestrian network quality assessment tool as well as confidence metrics with no required reference data

Potential use cases

- Walksheds tool, prioritization schema via sidewalkscore, accessmap trip planning, accessibility island id tool
- Technical expertise on AI/ML feature extractions from imagery (Vexcel Imaging)
- Use enhanced bike/ped data in national accessibility evaluation (UMN)
- Semi-dynamic data publishing for travelers and autonomous vehicles (VTI)

----End of question

Related Thoughts

- On-street bike lanes ideally are L side / R side attributes of the roadway. So integrated approaches with roads data is preferred, but difficult
- Agree with with comment about a Tiered set of AT attributes & phased implementation. Get the basics first! But provide a framework to work toward the nice2haves
- These listed impacts miss another critical opportunity area: the public health benefit of increased widespread active transportation. Life Expectancy in the US is among the lowest among developed nations, despite some of the highest health care expenditure. A tremendous contributor is the diseases of sedentary living (e.g. cardiovascular disease, stroke, Type II diabetes, cancer, dementia in aging), and the CDC has recognized the importance of daily active living as a remedy to our epidemic of physical inactivity.
- Also important to frame nonmotorized transportation infrastructure as a key social determinant of health. So often, the most vulnerable members of our country do not have reliable vehicular access. Sidewalks, bikelanes, etc can be key connections to education, jobs, clinics, etc.
- A few years ago, we worked on a project related to digital sidewalk inventory with the City of Riverside. <https://journals.sagepub.com/doi/abs/10.1177/0361198119842820>
- We can use satellite data to also understand how travel decisions are made: <https://arxiv.org/abs/2303.04204>
- Please post contact information for the OSM Government committee.
- It might be great to get a list and affiliation for attendees to network?
- There are a ton of comments to try to keep track. Is it possible to receive a comment data dump at the end of the meeting?
- [Example of OSM-based sidewalk routing \(US DOT to the Capitol\)](#)
- if we're allowed to share wares... here's an example of multimodal pedestrian trip planning with two walking segments using OpenSidewalks data (the personalization card requires curbed ramps and limits on uphill/downhill grades), indoor transit paths and use of scheduled rail. https://www.accessmap.app/dir?wp=-122.3252961_47.5988801%27-122.3272837_47.7030293®ion=wa.seattle&lon=-122.430268&lat=47.6260715&z=10.27&sa=1&mu=0.05&md=0.1&ab=1
- The micromobility QC methods are all detailed in appendix B in the 2022 FHWA TMG.
- I'm working with this group and if funded for a second round, we hope to work with many cities to use AI for capturing pedestrian access data - https://www.nsf.gov/awardsearch/showAward?AWD_ID=2236277&HistoricalAwards=false
- I met someone on the breakout, she is the bicycle coordinator from Iowa DOT, we need to interview her and ask about her needs working with different MPOs, etc.. we need to work on the capacity of the State DOTs as well as the local jurisdictions, MPOs and the private sector.
- TRB Committee on Accessible Transportation and Mobility is having a related workshop at TRB Sunday 1/7 at 9-12pm. presentation titles will be updated soon: <https://annualmeeting.mytrb.org/Workshop/Details/20769>
- Also on Sunday morning Jan 7 at TRB another workshop on Bike/ped data fusion: <https://sites.google.com/site/bikepeddata/2024-data-fusion-workshop?authuser=0>
- Another relevant Sunday morning TRB workshop on mobility data interoperability: <https://annualmeeting.mytrb.org/Workshop/Details/20712>

- Thank you for organizing! If anyone is interested in any of the OSM US working groups, please feel free to fill this form <https://openstreetmap.us/get-involved/working-groups/>
- Roadway data is collected thru the FHWA Travel Monitoring Analysis System (TMAS). In here we have 7,000 volume sites, 3,200 class sites and 530 weight data permanent sites.
- <https://www.fhwa.dot.gov/policyinformation/hpms.cfm>
- https://www.fhwa.dot.gov/policyinformation/hpms/documents/arnold_reference_manual_2014.pdf
- <https://www.fhwa.dot.gov/policyinformation/tmguides/>
- <https://www.fhwa.dot.gov/policyinformation/hpms/fieldmanual/>
- https://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm
- <https://highways.dot.gov/safety/data-analysis-tools/mire-fde/model-inventory-roadway-elements-mire#MIRE-FDE>
- I think the answer is that the roads are considered part of the transportation system and have a massive bureaucracy and funding pipeline but sidewalks are outside of that because they are not considered part of the transportation network.
- Does anyone have an opinion on a good high quality source of ped and bike use data that isn't manual counts or sparse sensors?
 - Strava Metro?
 - For count data, yes - it is part of the TMG now.
 - Be careful using probe based data sources. Accuracy/precision of these new data sources may not be as good as you need to base decisions on these data sources.
 - Strava to understand *what routes are possible* is genius - cut throughs off known roads/trails are super hard to know or find from static imagery alone.
 - Another source of information to establish a need for ped/bike infrastructure/networks is to look at EMS encounters using [NEMSIS](#). Many ped/bike incidents are not classified as motor vehicle crashes, but if injuries occur and EMS is called, there will be an EMS record. Not an end-all-be-all, but another angle to support making the case.
- Not infra, but example of fed suggestion for data schema: <https://www.nhtsa.gov/mmucc-0>
- Is there a standardized format for submitting ped/bike data from the states? Is it only volume data?
 - We have a format in the Traffic Monitoring Guide, it not only includes volume but also classification for Micromobility devices.
 - The Nat'l Bikeway Network that Steven led development of includes a bike facility data format https://nmtdev.ornl.gov/assets/templates/NBN_DataTemplates_final.pdf
- WSDOT's frequent transit service study: <https://wsdot.wa.gov/construction-planning/search-studies/frequent-transit-service-study>
- Don't waste your time with HPMS data for this topic. Lidar data from the data collection vehicles can be a source but the States would need to include it in the data collection deliverables and it would not get everything.
 - Our company utilizes LiDAR, which can essentially get everything except whether the pushbutton works. But ONLY if the LiDAR is of appropriate quality.
 - I know what can be done with Lidar but tons of details to consider. HPMS could get there some day.

- <https://www.outsight.ai/insights/city-of-bellevue-wa-partners-with-outsight-for-intersection-safety>
- Does FHWA or BTS have a accuracy requirement for data collected?
 - Yes see the HPMS Field Manual and the Traffic Monitoring Guide.
- Do you have insight to share from your international work?
 - They have the same problems with data scarcity
- For Bike Ped count data <https://bikeped.trec.pdx.edu/explore/>
- National Bikeway Network Data Portal <https://nmtdev.ornl.gov/#/>
- Anyone or any agency can send in bikeway network GIS data sets to the National Bikeway Network. If you have any questions on what we have and how you can send in your data, please let us know.
- There are so many different questions:
 - What data are most important to collect, for what purpose?
 - what data collection method(s) are most accurate and useful?
 - We won't reach perfection, so how do we balance gathering the best data with the data that is easier to collect and will get wider use?
- BTS folks - is the scope of this group going to include volume (& other) data types, or are you limiting to network/facility data?
- Let's remind ourselves that ped and bike counts are not the key to building infrastructure, because in areas where it's too dangerous to walk and bike we may see very low current ped/bike activity. A key reason this network data is so crucial
- check into a different way to get at network needs: <https://geo-massdot.opendata.arcgis.com/datasets/MassDOT::potential-for-everyday-biking/explore>
- For QC TMAS uses, including micromobility QC: [2022 Traffic Monitoring Guide Appendix B \(dot.gov\)](#)
- isn't network data made up of section level counts?
- Would asset condition be within scope of a FGDC effort?
 - Having at least a framework within the standard would be critical to making it useful locally.
- Do we know what types of data are we collecting for this effort? Just sidewalks and crosswalks or more? At what level? do we just want presence or we also want something like sidewalk width? crosswalk patterns?
- This was the main goal of the Tile2Net model to help map where sidewalks, crossings and footpaths are: <https://github.com/VIDA-NYU/tile2net/tree/main>
- [NBN \(ornl.gov\)](#)
 - NBN GIS format: [NBN DataTemplates final.pdf \(ornl.gov\)](#)
- I hope the public is the best source of data about public infrastructure
- I propose that we may want to start at a most Fundamental network data, such as presence of sidewalks, curb ramps, and crosswalks. Then add details (sidewalk width, road setback, surface quality, and much more) over time. A tiered or phased approach
 - Please check out <https://github.com/OpenSidewalks/OpenSidewalks-Schema/tree/Audiom>: Audiom is the "higher tier" data, where the basal schema is more basic transportation graph like Mark describes

- We could benefit from identifying desired use cases for these data, so we can back into a MVP version of that
- Aerial imagery is great as long as there aren't trees in the way.
- Industry is selling asset management services. Mostly for vehicle traffic. The roadside data are limited. The market for vehicle data seems much stronger than pedestrian data. That is why there seems to be a government role to support pedestrian network data.
- street-level imagery is also super useful for mapping - we manage and maintain <https://www.mapillary.com/>
- For the next meeting, I think it would help us to see what the work zone data exchange is all about.
- <https://highways.dot.gov/civil-rights/programs/ada/ada-transition-plan-and-inventory-map>
- Also this one to collect surface material data: <https://github.com/VIDA-NYU/city-surfaces>
All free and open
- a city I'm working with in Sweden mounted cameras on garbage truck wind shields and used image analysis software to analyze it. Here's a google translated link: https://innovation-helsingborg-se.translate.goog/initiativ/sa-har-mar-stadens-gator-nu-far-vi-koll-som-aldrig-forr/? x tr sl=sv& x tr tl=en& x tr hl=en& x tr_pto=wapp
- How do we express interest in ongoing involvement? Is our attendance enough to get on the future messages for next steps? Thanks!
- Will there be a periodic newsletter or something that we can read? I generally don't like following GitHub since it can be really noisy with all the activity that goes on there.
- I think a working group about workflow/processes for creating and inventorying sidewalk and bike data....(not just sources)...
- <https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=d3c32c758316402dbd8292b7ffea720e>
- https://experience.arcgis.com/experience/ad84c74c270f4a018a8da81d7e16e917/?data_id=0ced71a127604e59b36907e373f1046e-1853c00b27a-layer-6-1853bf87ef8-layer-4%3A1315
- <https://ngda-transportation-geoplatform.hub.arcgis.com/pages/federal-trails-working-group>
- <https://highways.dot.gov/research/publications/ear/FHWA-HRT-23-084>
- <https://github.com/VIDA-NYU/tile2net/tree/main>
- <https://ruralinnovation.us/>