METRICS FOR TRACKING CLIMATE CHANGE ADAPTATION

Urban & Environmental Policy Institute
Occidental College
L.A. Regional Transit Climate Adaptation Roundtable
May 2013
> introduction & methods

> literature review

> criteria for ranking methods

> priority metrics

> further research
**TASK** > research and recommend metrics that Metro can use to track the progress of the agency’s climate change adaptation efforts

**BENEFIT** > positive feedback loop between action and data

**GOAL** > resilient transit system that continues to serve and link Los Angeles County’s diverse communities
PROCESS
> literature review
> criteria
> metro operations
> metrics
> ranking
LITERATURE REVIEW

> transit agency climate plans (LA + FTA pilot peers)
> big city climate plans
> climate & infrastructure
> public health, community engagement
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Summary</th>
<th>Rationale</th>
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<tbody>
<tr>
<td>criticality</td>
<td>Does metric inform risks to critical asset?</td>
<td>Protect critical assets</td>
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<tr>
<td>severity</td>
<td>Does metric inform anticipated significant risks to assets and/or riders?</td>
<td>Adapt to severe impacts</td>
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<tr>
<td>equity</td>
<td>Does metric inform impacts on transit-dependent and diverse communities/riders?</td>
<td>Protect most vulnerable riders/communities</td>
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<tr>
<td>feasibility</td>
<td>Is it easy or difficult to gather this data?</td>
<td>Understand what needs to be done to track metric</td>
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<tr>
<td>cost</td>
<td>Is metric cost effective to implement?</td>
<td>Prioritize higher impact, lower cost metrics; ensure budget is adequate to gather important data</td>
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<tr>
<td>best practice</td>
<td>Is metric gathered by other transit agencies or related climate adaptation efforts?</td>
<td>Learn from literature review and peers; be able to share data and methods</td>
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<tr>
<td>climate</td>
<td>Does data add to understanding of local weather/ climate?</td>
<td>Improve access to real time weather data and climate change forecasting</td>
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<tr>
<td>visibility</td>
<td>Does metric help inform public on need for climate adaptation?</td>
<td>Expand awareness of climate change, need for adaptation, and agency efforts</td>
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<tr>
<td>participation and governance</td>
<td>Does metric involve employees and/or staff and/or improve ability to coordinate actions</td>
<td>Broaden involvement in and coordination of adaptation efforts</td>
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<tr>
<td>design</td>
<td>Does metric inform system design as well as operations?</td>
<td>Help create resilient, widely-used system</td>
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<tr>
<td>mitigation</td>
<td>Does metric inform mitigation as well as adaptation?</td>
<td>Help reduce emissions and mitigate impacts of climate change</td>
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METRO OPERATIONS

- survey of personnel
- discussions with climate team
- links with environmental management systems
METRICS RANKING

> 109 metrics
> points based on criteria
> sorted high to low
1. Have impacts on riders been analyzed? (43 points)
2. Has vulnerability assessment been conducted? (39 points)
3. Mean Distance Between Failure (MDBF) for buses by temperature and geography (39 points)
4. Have adaptation actions been prioritized? (38 points)
5. Have vulnerable assets been mapped with transit dependent and low-income populations? (37 points)
6. Number of injuries/medical emergencies to workers and riders by temperature and rainfall (37 points)
7. Does agency have overheating standards for public transport facilities and rolling stock? (37 points)
8. Is there ongoing and regularly convening team tasked with implementing climate adaptation plans? (37 points)
9. Percent of climate adaptation recommendations/actions from adopted plans implemented (37 points)
10. Capacity to monitor weather and temperature conditions in real time at key locations in service area (36 points)
11. Extreme weather impacts on service delays and cancellations (36 points)
12. Percent of Metro facilities and vehicles with cool roofs (36 points)
13. Does agency conduct regular climate planning updates? (36 points)
14. Are climate adaptation indicators tracked in agency’s Environmental Management System and/or Asset Management System? (36 points)
15. Number of rail kinks/buckling by temperature and by heat island areas (35 points)
16. Number of technical advisors and members of the broader community included in climate adaptation team (35 points)
17. Do agency design standards consider climate adaptation? (35 points)
18. Has agency designated evacuation routes? (35 points)
19. Progress in reducing vulnerabilities based on meta-analysis of climate adaptation indicators. (35 Points)
20. Funding needed and provided to implement climate adaptation (35 points)
NEXT STEPS

> agencies track metrics that make sense for their operations
> more evidence on utility of metrics
> more research on user experience, equity, climate response