Addendum:

The Real Costs of Communications Outages due to Infrastructure Theft or Vandalism[1]

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Executive Summary of Addendum Findings:

This Addendum updates the initial paper finding that telecommunications service outages caused by copper theft and vandalism from June through December 2024 imposed up to **$188 million** in foregone economic value. These social costs far exceed the replacement value of stolen copper, damaged equipment, or repaired facilities.

Updated incident data reported for January through December 2025 shows that the problem has grown sharply in both scale and severity. Nationwide in 2025 there were **18,327 incidents** disrupting service to **11.8 million service locations**, up from the 2024 annual rate of 11,540 incidents and 3.0 million affected service locations. This is a **58.8 percent** increase in incidents and an almost **four-fold increase** in affected service locations.

Using the willingness-to-pay framework developed in the initial paper, the estimated societal cost of these 2025 service disruptions is up to **$1.47 billion** in foregone economic gain, which again far exceeds the replacement value of stolen or damaged equipment. These figures reflect only the outage-related costs of critical infrastructure theft and vandalism. They do not include broader adverse impacts on communities, scarce law enforcement resources, public safety, business continuity, or emergency response. For that reason, these estimated real costs are conservative. Even under lower assumptions about asymmetric loss and network diseconomies, these real costs range from **$294 to $735 million** in foregone economic value.

This Addendum's updated data also show that the incidents and real costs of infrastructure theft and vandalism have become even more unevenly distributed across states. California and Texas remain the two highest-incident states, together accounting for **47.6 percent** of reported incidents nationwide in 2025. California's burden has worsened substantially, with **6,297 reported incidents**, a 74.4 percent increase from 2024 and 2.6 times the number reported in Texas. California's estimated societal cost alone is **$252.6 million** in 2025, and its relative magnitude remains highly elevated compared with the size of its economy.

While still ranked second nationally with **2,428 incidents**, Texas did experience a smaller increase in incidents (9.0 percent) from 2024, however, its estimated societal cost is still approximately **$97.4 million**. Compared with the size of its economy, the relative magnitude of communication outages due to theft and vandalism in Texas remains well above the national average.

Kentucky and North Carolina continue to illustrate how the problem affects smaller and mid-sized states as well. Kentucky's **542 incidents** impose a disproportionate burden relative to the size of its economy, while North Carolina's **650 incidents** remain closer to the national average in relative economic impact.

These incidents of critical infrastructure theft and vandalism cannot be viewed as isolated property crimes. By attacking communications networks, they generate cascading economic losses for households, businesses, public services, and communities. Because these estimates are based only on reported incidents and their outage-related losses, the true societal cost is almost certainly higher.

Introduction:

This Addendum updates the initial paper's analysis to include using new incident data from January through December 2025.

According to industry data provided to the author, theft or vandalism of communications infrastructure increased in 2025 to a nationwide total of **18,327 incidents**, disrupting service to **11,763,822** service **locations**. This represents a 58.8 percent increase in incidents, and a nearly four-fold increase in affected service disruptions, as compared to the annualized estimate of incidents and locations affected in 2024.

National Level Real Cost Estimates:

Table 2A below reports the estimated aggregate real costs in terms of foregone willingness-to-pay (deadweight loss) caused by these 18,327 incidents affecting 11.8 million customers. These updated real costs use the same methodology as reported in Table 2 of the initial paper linked above. They are calculated using the same formula, RC = (WTP_t) x (H) x (m_1 +m_2), assuming a service outage equivalent to one day, for an array of asymmetric loss and network diseconomies assumptions.

At the low end of the plausible range, the estimated cost of these outages is **$294.1 million**, but if the asymmetric loss and network diseconomies multipliers are on the higher end, then the real cost of service outages climbs to **$1.47 billion**. These updated costs have increased nearly four-fold on an annualized basis from 2024 to 2025.

Table 2A: Real Costs Under Alternative Scenarios—Updated to 2025 Data
Aggregate Foregone WTP Assuming 11.8 million Customers and Average Outage Duration of One Day

	Lowest m_1=2	Low m_1=5	Moderate m_1=10
Lowest m_2=2	$294,095,550	$514,667,213	$882,286,650
Low m_2=5	$514,667,213	$735,238,875	$1,102,858,313
Moderate m_2=10	$882,286,650	$1,102,858,313	$1,470,477,750

State Level Real Cost Comparisons:

Similarly, Table 3A below updates the state comparisons reported in Table 3 of the initial paper. As the first two rows of the table show, the severity of the problem has worsened nationwide and in each of the four comparison states listed. California's number of incidents jumped by 74.4 percent compared to the national average of 58 percent, while Texas experienced a smaller increase of 9 percent over the previous year. California and Texas continue to rank first and second, respectively, with their combined share of reported incidents remaining close to half the national total at 47.6 percent. Furthermore, the gap between the two leading states has increased markedly: in 2024, California had only 1.6 times as many incidents as Texas, but in 2025 has 2.6 times as many as Texas.

Table 3A: Real Costs of Service Disruptions: Select States

	United States		**California**		**Texas**		**Kentucky**		**North Carolina**	
	2024	**2025**	**2024**	**2025**	**2024**	**2025**	**2024**	**2025**	**2024**	**2025**
Reported Incidents / Year	11,540	18,327	3,610	6,297	2,226	2,428	452	542	330	650
Percent Increase	58.8%		74.4%		9.0%		19.9%		96.9%	
National Rank	n/a	n/a	1	1	2	2	7	6	6	7
Percent of Nationwide Incidents	100%	100%	31.28%	34.36%	19.29%	13.25%	3.92%	2.96%	2.86%	3.55%
Real Costs of Service Disruptions	**$187.5m**	**$735.2m**	**$58.7m**	**$252.6m**	**$36.2m**	**$97.4m**	**$7.35m**	**$21.8m**	**$5.4m**	**$26.1m**
Size of Economy (GDP)	$29.18 trillion		$4.10 trillion		$2.71 trillion		$0.29 trillion		$0.84 trillion	
State Share of National GDP	100%		14.04%		9.28%		0.99%		2.87%	
GDP per Capita	$85,810		$104,061		$86,581		$63,043		$75,675	
Relative Magnitude of the Problem	6.43	25.20	14.30	61.61	13.35	35.95	25.34	75.04	6.38	31.07

Table 3A Notes: All dollar amounts are in nominal 2024 values. Incident data for June to December 2024 come from NCTA et al. (2025, Figure 2, p.8) and are shown in the table on an annualized basis equal to two times their six-month 2024 rate. State GDP per Capita is from Bureau of Economic Analysis. As explained, real cost of service disruptions is calculated as aggregate, cumulative dollars assuming m_1=m_2=5 as in Table 2A. Relative magnitude at the bottom of the table is calculated as (Real Costs/GDP)x(1,000,000).

Table 3A also reports the state-specific costs of service disruptions, using the baseline of $735 million from the moderate assumptions in Table 2A. On an annualized basis, communications infrastructure theft and vandalism imposed a whopping $252.6 million on California in 2025, up from $58.7 million in 2024. Because California's share of national incidents is much larger than its share of national GDP, the relative magnitude of the problem in California remains quite elevated as well, increasing from a factor of 14.30 in 2024 to 61.61 in 2025, far exceeding the national average of 25.20. In Texas, the estimated real costs increased from $36.2 to $97.4 million, and its relative magnitude rose from a factor of 13.35 to 35.95, also far exceeding the national average.

Kentucky and North Carolina still serve as useful reference points, with relative magnitude factors of 75.04 and 31.07, respectively. Smaller states like Kentucky may experience fewer incidents, but the relative damage to their economies is far greater. North Carolina, meanwhile, continues to illustrate what a state closer to the national average looks like in relative economic terms.

Alternative Outage Duration Assumptions:

One caveat to the above analysis is that the reported incident and affected service locations data do not include actual outage duration. This data limitation requires the analysis to assume an average outage duration. Both the initial paper and this Addendum use an average outage equivalent to one day.

However, one full day might not be realistic compared to the actual duration of outages customers experience due to infrastructure theft and vandalism. The estimates therefore should also be evaluated under shorter average outage assumptions, such as 12 hours, eight hours, or four hours.

Table 4A in the Appendix below captures different possibilities ranging from an average of one-hour service disruption to an average of 24 hours. First, notice that the dollar estimates in the upper left of Table 4A under “24 hours” correspond exactly to the dollar estimates reported in Table 3A above. Both represent the estimates when assuming one full day of service disruption. Next, notice that the dollar amounts decrease in Table 4A as average outage duration decreases. Finally, notice that the real cost estimates are reported for the same values of asymmetric loss and network diseconomies multipliers, m_1 and m_2 respectively.

Constructed in this manner, Table 4A provides comparisons to the 24-hour real cost estimates in Table 3A. For example, at a 9-hour average duration, the estimated real cost is $275.71 million of foregone economic value (deadweight loss). The other entries in the table are interpreted in the same way.

While the results in Table 4A might be more realistic than those in the one-day baseline scenario, these are still very large magnitudes, and they still support the same conclusions. The real costs of communications infrastructure theft and vandalism exceed repair and replacement costs, and they still go beyond directly affected customers.

Conclusion:

With affected service locations increasing nearly four-fold, this Addendum to the initial paper reinforces the same conclusions: the social costs of critical infrastructure theft and vandalism far exceed the replacement value of stolen and damaged materials. These incidents do not only burden the affected customers and owners of damaged or stolen infrastructure. Instead, because these illegal incidents affect communications networks, their harms cascade onto millions of households and businesses nationwide, multiplying into hundreds of millions dollars, and potentially well over one billion dollars, in economic losses. These costs impose a significant drag on economic well-being across the nation. In addition, the number of these incidents and their real costs have become even more unevenly shared, as the problem has worsened substantially in California.

Importantly, for the same reasons discussed in the initial paper, these estimates are conservative compared to the likely magnitude of the actual problem. These estimates account only for one dimension of the problem, namely the social costs of outages. But there are wider consequences that adversely impact the health, safety, and welfare of these communities.

Foundational work in the economics of crime (Becker 1968, Tullock 1969) suggests that law enforcement and prosecutor budgets must shift scarce enforcement resources toward these communications infrastructure attacks and away from other needs such as violent crime. Empirical research counts this diversion of law enforcement resources among the aggregate costs of crime (Anderson 2021, 1999). As agencies must shift significant resources to investigate theft and vandalism of critical communications infrastructure, this reduces their capacity to support overall community safety and well-being.

Furthermore, the incident and outage estimates used in the initial paper and this Addendum are also conservative because these data come from surveys of service providers and “should not be considered a full accounting of activity” (NCTA et al. 2025, p.7).

Even these conservative estimates show that the true social costs of critical infrastructure theft and vandalism far exceed the replacement costs of damaged or stolen materials. This updated analysis reinforces the need for policymakers, industry, law enforcement, and communities to take meaningful action to safeguard America’s communications networks and the economic well-being they sustain.

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Appendix:

Table 4A: Real Costs of Service Disruptions Under Alternative Duration Assumptions
(in millions of dollars)

m_1	2	5	10	2	5	10	2	5	10
m_2		**24 hours**			**23 hours**			**22 hours**	
2	$294.10	$514.67	$882.29	$281.84	$493.22	$845.52	$269.59	$471.78	$808.76
5	$514.67	$735.24	$1,102.86	$493.22	$704.60	$1,056.91	$471.78	$673.97	$1,010.95
10	$882.29	$1,102.86	$1,470.48	$845.52	$1,056.91	$1,409.21	$808.76	$1,010.95	$1,347.94
		21 hours			**20 hours**			**19 hours**	
2	$257.33	$450.33	$772.00	$245.08	$428.89	$735.24	$232.83	$407.44	$698.48
5	$450.33	$643.33	$965.00	$428.89	$612.70	$919.05	$407.44	$582.06	$873.10
10	$772.00	$965.00	$1,286.67	$735.24	$919.05	$1,225.40	$698.48	$873.10	$1,164.13
		18 hours			**17 hours**			**16 hours**	
2	$220.57	$386.00	$661.71	$208.32	$364.56	$624.95	$196.06	$343.11	$588.19
5	$386.00	$551.43	$827.14	$364.56	$520.79	$781.19	$343.11	$490.16	$735.24
10	$661.71	$827.14	$1,102.86	$624.95	$781.19	$1,041.59	$588.19	$735.24	$980.32
		15 hours			**14 hours**			**13 hours**	
2	$183.81	$321.67	$551.43	$171.56	$300.22	$514.67	$159.30	$278.78	$477.91
5	$321.67	$459.52	$689.29	$300.22	$428.89	$643.33	$278.78	$398.25	$597.38
10	$551.43	$689.29	$919.05	$514.67	$643.33	$857.78	$477.91	$597.38	$796.51
		12 hours			**11 hours**			**10 hours**	
2	$147.05	$257.33	$441.14	$134.79	$235.89	$404.38	$122.54	$214.44	$367.62
5	$257.33	$367.62	$551.43	$235.89	$336.98	$505.48	$214.44	$306.35	$459.52
10	$441.14	$551.43	$735.24	$404.38	$505.48	$673.97	$367.62	$459.52	$612.70
		9 hours			**8 hours**			**7 hours**	
2	$110.29	$193.00	$330.86	$98.03	$171.56	$294.10	$85.78	$150.11	$257.33
5	$193.00	$275.71	$413.57	$171.56	$245.08	$367.62	$150.11	$214.44	$321.67
10	$330.86	$413.57	$551.43	$294.10	$367.62	$490.16	$257.33	$321.67	$428.89
		6 hours			**5 hours**			**4 hours**	
2	$73.52	$128.67	$220.57	$61.27	$107.22	$183.81	$49.02	$85.78	$147.05
5	$128.67	$183.81	$275.71	$107.22	$153.17	$229.76	$85.78	$122.54	$183.81
10	$220.57	$275.71	$367.62	$183.81	$229.76	$306.35	$147.05	$183.81	$245.08
		3 hours			**2 hours**			**1 hour**	
2	$36.76	$64.33	$110.29	$24.51	$42.89	$73.52	$12.25	$21.44	$36.76
5	$64.33	$91.90	$137.86	$42.89	$61.27	$91.90	$21.44	$30.63	$45.95
10	$110.29	$137.86	$183.81	$73.52	$91.90	$122.54	$36.76	$45.95	$61.27

Table 4A Notes: All dollar amounts are in millions of nominal 2024 values. Estimates are calculated using the same equation used in Table 3A above, weighted by the corresponding number of hours shown. The asymmetric loss and network diseconomies multipliers, m_1 and m_2 respectively, also function exactly as in Table 3A.