LEAP INSIGHTS · REPORT

The Reach of the Highway

National-highway toll traffic and the freight corridors linking Indian cities

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SUMMARY

Roads connect cities to markets, suppliers and ports, and the movement of goods between cities depends on the highway network. India publishes little current economic data for individual cities, but the electronic toll system records highway use directly: for each toll plaza on the highway network it reports, every month, the number of vehicles that pass and the revenue they pay. This report uses those records to examine two questions. The first is which cities lie on the tolled highway network. Of the Tier-2 and Tier-3 cities studied, 138 have a toll plaza within 30 kilometres and the remaining 95 do not, with the gaps concentrated in Maharashtra and among smaller towns. The second is the composition of the traffic on the highway beside each city. A toll plaza counts every vehicle that crosses it, whatever its origin or destination, so these are not the city's own vehicles but the traffic on the road it sits on. Because larger vehicles pay higher tolls, the revenue collected per vehicle shows how much of that traffic is freight, and where it is freight-heavy the road is a through-route for goods that lines up along the major freight corridors. The measure indicates which cities lie on freight corridors and which lie in the commuter belts around large cities — not how much freight a city itself generates.

KEY FINDINGS

- **Coverage.** Of the cities studied, 138 have a toll plaza within 30 kilometres and 95 do not. Coverage is geographically skewed — fuller across the northern plains and thinner in the peninsular states such as Maharashtra, where 27 of 71 cities are connected — reflecting the historical density of the highway network rather than a state's current economic output.
- **Freight corridors.** The plazas where freight makes up the largest share of traffic line up along the major national highways, including the Mumbai–Delhi belt, the Gangetic corridor and the Andhra coast. The median toll per vehicle on each corridor exceeds the overall median for the cities analysed, about Rs 170 (Figure 1; Table 2).
- **Freight intensity.** Toll revenue per vehicle ranges from about Rs 30 to more

than Rs 400. It is highest at Mundra, a major port, and at industrial cities such as Kanpur, and lowest at the plazas beside the large metros (Figure 2; Table A1).

- **Commuter belts.** Plazas beside the larger metropolitan areas, such as Noida, Panchkula and Hosur, carry high vehicle volumes but low revenue per vehicle, which beside a large city most plausibly reflects local commuting rather than long-distance freight.

1 Context

The connectivity of a city to the road network affects the cost at which it can obtain inputs and send its output to market. Cities on the national-highway network can reach ports, suppliers and larger markets at a lower transport cost than cities without such access. Transport connectivity is generally regarded as one of the conditions that support economic activity, and India has expanded its national-highway network considerably over the past two decades, including through the Golden Quadrilateral and the dedicated freight corridors. This report does not attempt to establish that highways cause cities to grow. It uses toll data to describe which cities are connected to the network and the composition of the traffic that passes through them.

The analysis is based on toll-transaction data from the tolled highway network. Since 2021, most vehicles on the tolled highways pay electronically through the FASTag system, operated by the Indian Highways Management Company Limited (IHMCL), which records for each plaza and each month the number of vehicles that pass and the revenue collected. The system covers the national highways, which make up the great majority of tolled roads, together with the state-highway plazas that have been integrated into the national electronic-tolling (NETC) network; state-highway plazas outside that network are not recorded. The data provides a continuous and near-complete record of highway use, which is not otherwise available for individual cities. This is the fourth in a series of LEAP reports that study India beyond the metros, examining its Tier-2 and Tier-3 cities through individual administrative datasets; the earlier reports used vehicle registrations, airport passenger traffic and financial wealth.

To construct a city-level measure, each toll plaza was matched to the nearest city within 30 kilometres, and the monthly traffic at all of a city's matched plazas was summed. The toll is recorded vehicle by vehicle at the plaza, and does not identify where a vehicle has come from or is going. A toll plaza therefore records

the traffic on the highway near a city rather than on the city's own roads, and for a city on a major corridor this consists largely of vehicles passing through. The analysis describes the character of that traffic — whether it is mostly freight or mostly cars — and hence whether a city lies on a route used for the movement of goods, rather than the amount of traffic the city itself generates.

2 Evidence

2.1 Coverage of the highway network

Of the Tier-2 and Tier-3 cities studied, 138 have a national-highway toll plaza within 30 kilometres. The remaining 95 cities have no plaza within this distance and are therefore not represented in the traffic data. Increasing the threshold to 50 kilometres raises the number of cities within reach of a plaza to 214, but at this distance the recorded traffic increasingly reflects highway movement unrelated to the city, and the 30-kilometre threshold is used throughout.

The cities without coverage are not distributed evenly. The pattern is geographical: coverage is fuller across the northern plains and thinner in the peninsular states, which reflects the historical density of the national-highway network rather than the current economic output of the cities. In Maharashtra, 27 of 71 cities have a nearby national-highway plaza, and many of the rest are served by state highways that fall outside this dataset. Coverage is more complete across the northern plains, including Uttar Pradesh (13 of 14 cities), Haryana (9 of 9) and Madhya Pradesh (7 of 7), where the highways pass close to the cities. Table 1 reports coverage for the states with the most cities in the study.

Table 1. Coverage of the national-highway network, for the eight states with the most cities in the study. Coverage reflects the density of the highway network rather than a state's level of economic activity.

State	Cities studied	On the network	Covered (%)
Maharashtra	71	27	38
Gujarat	31	17	55
Andhra Pradesh	20	14	70
Uttar Pradesh	14	13	93
Telangana	14	6	43
Punjab	10	8	80
Haryana	9	9	100
Karnataka	9	7	78

2.2 Freight corridors

Figure 1 shows the cities on the toll network. Each city is sized by the volume of traffic at its plazas and shaded by the toll revenue per vehicle. The plazas where freight makes up the largest share of traffic are distributed along the major national highways rather than evenly across the country, so the cities on those highways line up into corridors.

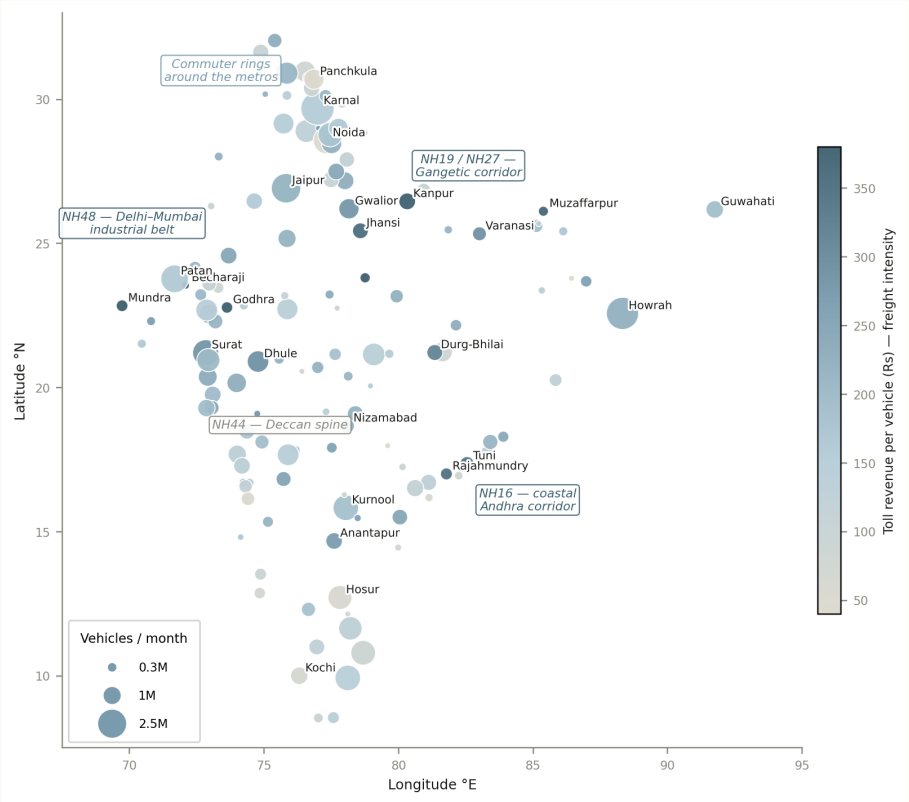

Figure 1. Cities on the national-highway toll network. Circle size is proportional to the monthly volume of traffic at a city's plazas, and shading indicates toll revenue per vehicle, an approximate measure of freight intensity. Plazas where freight makes up a high share of traffic are aligned along the major highways.

The largest of these is the Mumbai–Delhi industrial belt along NH48 and the associated Delhi–Mumbai corridor. It includes fourteen connected cities, among them the port of Mundra, the manufacturing town of Becharaji, Surat, Vadodara, Anand and Navsari, which together account for more than ten million vehicles a month at a median toll above the overall figure. A second corridor runs across the Gangetic plain along NH19 and NH27 and includes Kanpur, Jhansi, Gwalior, Varanasi, Prayagraj, Patna and Howrah. A third follows the Andhra coast along NH16, from Srikakulam through Vizianagaram, Rajahmundry, Tuni and Ongole. Two further corridors are the Deccan route along NH44 and the industrial belt around Durg-Bhilai. On each corridor the median toll per vehicle is higher than

the overall median, which indicates a higher share of freight traffic. Table 2 summarises the five corridors.

Table 2. Freight corridors identified in the toll data. The median toll per vehicle on each corridor exceeds the overall median for the cities analysed, about Rs 170. Corridor groupings are described in the method note.

Corridor	Cities	Vehicles/mo (M)	Median Rs/veh
Mumbai–Delhi industrial belt (NH48 / DMIC)	14	10.3	233
Gangetic corridor (NH19 / NH27)	11	9.1	252
Coastal Andhra corridor (NH16)	5	2.6	239
Deccan spine (NH44 / NH65)	6	4.8	236
Eastern steel belt (NH53 / NH130)	3	2.2	225

2.3 Commuter traffic around major cities

Traffic around the larger metropolitan areas has a different composition. Near Delhi, the cities with the highest toll volumes, including Noida, Panchkula, Karnal, Rupnagar and Ambala, collect comparatively little revenue per vehicle, because the traffic at their plazas consists mainly of cars and two-wheelers travelling into the metropolitan region. The toll per vehicle at Noida is about Rs 29 and at Panchkula about Rs 37, compared with a median of about Rs 170 for the cities analysed. A similar pattern is found around Bengaluru, where the plazas at Hosur record about Rs 56 per vehicle, and along the Kerala coast near Kochi. Figure 2 contrasts the cities with the highest and lowest toll revenue per vehicle.

A small number of cities combine high traffic volumes with a high share of freight. Surat and Dhule are examples; both carry large volumes and a high revenue per vehicle, consistent with manufacturing economies that produce and transport goods in quantity.

3 Implications

3.1 Connectivity and growth

The toll data provides a direct measure of which cities are connected to the national-highway network. The 138 connected cities can move goods on the network at a relatively low cost, while the cities without access face higher transport costs. The data does not establish that highway access leads to growth, since growth has many determinants and transport is only one of them. It does, however, identify the cities that lack this form of connectivity, which is relevant to decisions about

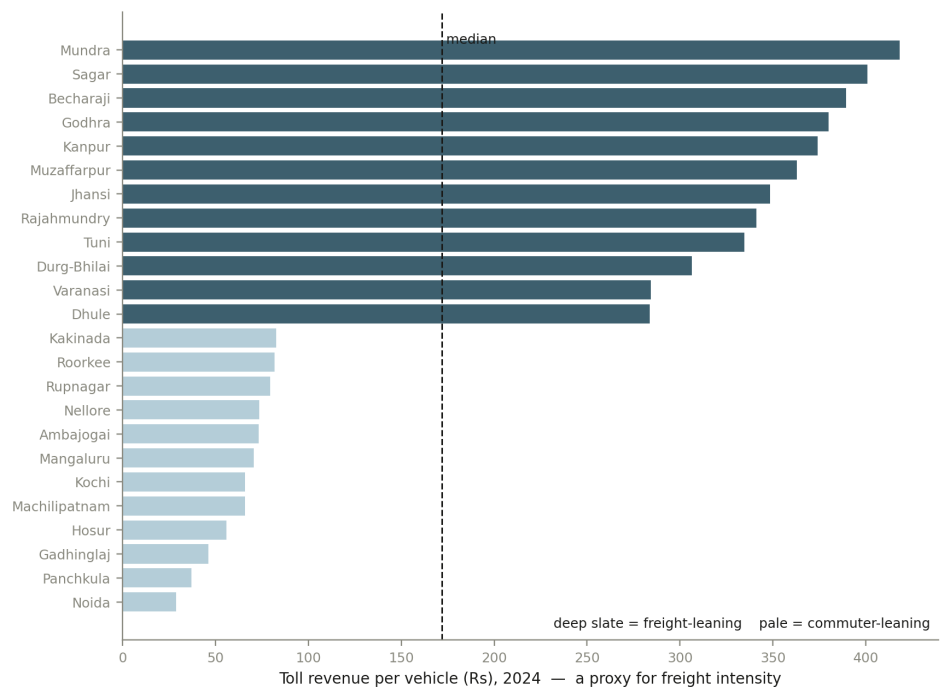

Figure 2. Toll revenue per vehicle in 2024 for the twelve cities with the highest and the twelve with the lowest values, among cities with at least 100,000 vehicles a month. The dashed line marks the median for these cities.

where the highway network might be extended.

3.2 Corridors as the unit of analysis

The traffic at an individual city is difficult to interpret on its own, because a high volume may reflect either freight or commuter traffic. Considered together with neighbouring cities, the data resolves into corridors, which are a more informative unit. A city located on the Mumbai–Delhi belt or the Gangetic corridor sits on a road that carries a long chain of freight, regardless of the volume at its own plaza. Toll revenue per vehicle is the measure that distinguishes freight corridors from commuter areas. IHMCL records the vehicle-class composition of traffic at each plaza but does not publish it; publication would allow freight intensity to be measured directly rather than inferred.

3.3 Cities not on the network, and the state highways

The cities without coverage are as relevant as the corridors. Parts of Maharashtra, Telangana and Karnataka, and a number of smaller towns elsewhere, have no national-highway plaza nearby and do not appear in the data. Many of them are served by state highways, which carry both freight and commuter traffic and act as feeders to the national highways. The dataset used here includes the state-highway

plazas that have been integrated into the national electronic-tolling network, but not those outside it, so some of these cities are under-represented rather than genuinely disconnected.

State highways do not, however, substitute for the national network. They are typically less well maintained, slower to travel, and without systematic information on closures for construction or maintenance, so long-distance freight continues to move mainly on the national highways. The corridors identified in this report are national-highway corridors; a full account of a region's road freight would also need the state-highway network, for which comparable toll data is not yet available.

3.4 One layer in a multi-signal city map

Toll traffic is a partial measure. It does not cover the cities outside the national-highway network, and it records through-traffic alongside local activity. It is most useful when combined with other administrative data on cities, such as vehicle registrations, airport traffic and financial wealth. Taken together, these sources provide an indirect substitute for the city-level economic statistics that India does not at present produce.

ACKNOWLEDGEMENTS

This report draws on a toll-traffic dataset assembled by Yuvi Bhatele, who geocoded the national-highway plazas, matched them to cities, and prepared the monthly traffic aggregates the analysis rests on. We thank her for that work.

SOURCE

Indian Highways Management Company Limited (IHMCL), monthly FASTag / NETC toll-plaza transaction data (vehicle counts and revenue), calendar years 2023 and 2024. Plaza-to-city matching, corridor groupings, revenue-per-vehicle figures and all city aggregates were computed by LEAP Insights.

Appendix — Toll traffic by city

Companion data to "The Reach of the Highway" (LEAP Insights, June 2026).

A note on method

Data source. Monthly toll-transaction records, comprising vehicle counts and revenue, from the electronic-tolling (FASTag / NETC) system operated by the Indian Highways Management Company Limited (IHMCL). The underlying series covers 36 months, from January 2023 to December 2025; the figures in this report use the calendar years 2023 and 2024.

Scope. The system covers the national highways — of the order of 850 tolled highways — together with the state-highway plazas that have been integrated into the national electronic-tolling (NETC) network, which number in the low hundreds. State-highway plazas outside the NETC network are not recorded, which is one reason some connected towns do not appear.

Steps. The city-level figures were built in four steps. First, the plaza-level FASTag records were assembled. Second, each plaza was located by mapping its name to coordinates. Third, each plaza was assigned to the nearest city lying within 30 kilometres; this distance rule alone determines the 138 cities with a toll reading. Fourth, the traffic of all plazas assigned to a city was summed. A 50-kilometre radius was also examined; it raises the number of reachable cities to 214 but assigns more through-traffic to cities to which it does not belong, so the 30-kilometre radius is used throughout.

What the figures count. For each city, the vehicle figure is the monthly average, across the calendar year 2024, of all toll transactions at its plazas — that is, all vehicle classes combined, from cars to multi-axle trucks. The revenue figure is the corresponding monthly average of the amounts collected. The 2023 figures are used only as the baseline for the year-on-year change.

Revenue per vehicle. A city's 2024 monthly toll revenue divided by its 2024 monthly vehicle count. Because toll rates increase with vehicle size, it approximates the share of freight in traffic; it also reflects the toll rate of the road segment, which varies with length and type, and is therefore an approximate rather than a direct measure. It is reported only for cities with at least 100,000 vehicles a month, to exclude the unstable ratios of very small plazas — a filter applied to this measure alone, and not used in selecting the 138 cities. The median across the 127 cities that meet this threshold is about Rs 170.

Growth. The year-on-year change is from 2023 to 2024 in average monthly vehicle count. A handful of cities show changes greater than 40 per cent; these gen-

erally reflect a plaza entering or leaving the electronic-tolling network — a change in digital coverage rather than in physical traffic — and should be interpreted with caution.

Table A1. The 50 most freight-intensive cities

The fifty cities with the highest toll revenue per vehicle in 2024 — an approximate measure of the freight share of traffic — among the 127 cities that have a toll reading and carry at least 100,000 vehicles a month. Vehicles are the 2024 monthly average of all toll transactions (all vehicle classes combined); revenue is in Rs crore per month. The year-on-year change is from 2023 to 2024, and a dash indicates the 2023 baseline was unavailable.

#	City	State	Rs/veh	Vehicles/mo	Rev (Rs cr)	YoY %
1	Mundra	Gujarat	418	393,281	16.4	+3.9
2	Sagar	Madhya Pradesh	401	301,240	12.1	+7.7
3	Becharaji	Gujarat	389	167,345	6.5	+0.9
4	Godhra	Gujarat	380	376,409	14.3	+8.3
5	Kanpur	Uttar Pradesh	374	796,863	29.8	-2.1
6	Muzaffarpur	Bihar	363	289,212	10.5	+2.9
7	Jhansi	Uttar Pradesh	348	708,508	24.7	+9.7
8	Rajahmundry	Andhra Pradesh	341	407,909	13.9	+2.0
9	Tuni	Andhra Pradesh	335	560,306	18.8	+4.2
10	Durg-Bhilai	Chhattisgarh	306	721,688	22.1	+1.6
11	Varanasi	Uttar Pradesh	284	549,015	15.6	-0.6
12	Dhule	Maharashtra	284	1,309,521	37.2	+30.7
13	Surat	Gujarat	278	1,917,209	53.2	+4.0
14	Gwalior	Madhya Pradesh	273	1,164,353	31.7	+1.9
15	Ahmednagar	Maharashtra	272	138,189	3.8	–
16	Anantapur	Andhra Pradesh	264	781,099	20.6	+8.4
17	Rajkot	Gujarat	260	232,854	6.0	+10.5
18	Nandyal	Andhra Pradesh	252	148,101	3.7	+3.2
19	Asansol	West Bengal	252	373,897	9.4	+4.0
20	Bidar	Karnataka	250	329,160	8.2	+0.1
21	Vijayapura	Karnataka	248	631,530	15.7	+15.4
22	Anand	Gujarat	246	1,026,038	25.3	+6.8
23	Udaipur	Rajasthan	239	787,555	18.8	+62.5
24	Ongole	Andhra Pradesh	239	685,970	16.4	+1.2
25	Bhiwandi	Maharashtra	237	600,864	14.3	+14.0
26	Srikakulam	Andhra Pradesh	234	355,628	8.3	+5.2
27	Mathura	Uttar Pradesh	234	788,642	18.5	+4.7
28	Bhopal	Madhya Pradesh	231	236,089	5.4	+18.2
29	Vapi	Gujarat	228	1,007,633	22.9	-2.0
30	Gurdaspur	Punjab	225	582,830	13.1	+1.8
31	Bilaspur	Chhattisgarh	225	374,033	8.4	+10.1
32	Nizamabad	Telangana	225	568,160	12.8	+6.4
33	Pimpalgaon Baswant	Maharashtra	222	1,074,878	23.9	+5.8
34	Agra	Uttar Pradesh	222	902,272	20.0	+5.0

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#	City	State	Rs/veh	Vehicles/mo	Rev (Rs cr)	YoY %
35	Howrah	West Bengal	219	2,929,070	64.1	+2.6
36	Jabalpur	Madhya Pradesh	217	505,927	11.0	+12.4
37	Bathinda	Punjab	217	120,689	2.6	-17.2
38	Bikaner	Rajasthan	216	221,136	4.8	+4.0
39	Jalgaon	Maharashtra	216	309,808	6.7	+10.5
40	Akola	Maharashtra	215	424,588	9.1	+76.7
41	Nirmal	Telangana	214	731,803	15.7	+5.8
42	Kota	Rajasthan	214	927,461	19.8	+8.6
43	Jaipur	Rajasthan	213	2,451,299	52.3	+0.9
44	Greater Noida	Uttar Pradesh	212	1,162,227	24.7	+18.6
45	Hubballi-Dharwad	Karnataka	210	344,932	7.2	-12.4
46	Vizianagaram	Andhra Pradesh	208	652,442	13.6	+36.7
47	Vadodara	Gujarat	208	631,999	13.1	+4.0
48	Prayagraj	Uttar Pradesh	208	201,488	4.2	+3.7
49	Yavatmal	Maharashtra	207	269,766	5.6	+5.2
50	Ludhiana	Punjab	205	1,379,103	28.3	-15.1

Source: IHMCL FASTag / NETC toll-plaza data, calendar 2024 (year-on-year change 2023–2024). City aggregates computed by LEAP Insights.