

A Study on Alternate Mode of Transport: Is Nagpur Ready For E-Rickshaw?

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Abstract:

Nagpur is the second capital of Maharashtra and serves as major commercial, industrial, educational, and medical center. Due to concentration of social, economic, educational and administrative functions in the city its degree of primacy is ever increasing which has resulted in increase in requirement of local transportation/ travel options. Local transport in Nagpur is important due to Nagpur's strategic location in central India. It is a rapidly growing metropolis and is the third most populous city in Maharashtra after Mumbai and Pune. Large chunk of population prefer public transport. The most popular means of transport is city bus service. Many people commute by auto rickshaw, taxi or the upcoming radio cabs. People also use services of cycle rickshaws for travelling short distances. With growth of the city and increasing traffic, numbers of cycle rickshaws in the city are depleting.

People face lot of problems related to local transportation like non availability of auto/ cycle rickshaw or over priced fares by auto, non availability of bus on some routes or changeover of buses to reach the destination, etc. In such a situation E-rickshaws can be a good option to travel short distances within the city. This study aims at probing into the problems related to local transportation in Nagpur and trying to evaluate feasibility of e- rickshaw as an option.

Keywords: Commute, E-Rickshaw, Economic, Transport, Service.

Introduction:

Transport is an important part of India's economy. Since the economic liberalization of the 1990s, infrastructure development has progressed rapidly; today there are a variety of modes of transport by land, water and air. Public transport remains the primary mode of transport for most of the population, and India's public transport systems are among the most heavily used in the world. The automobile industry in India is currently rapidly growing with an annual production of over 4.6 million vehicles, and vehicle volume is expected to rise greatly in the future.

Local transport in Nagpur is important due to Nagpur's strategic location in central India. It is a rapidly growing metropolis and is the third most populous city in Maharashtra after Mumbai and Pune. Nagpur district stretches over an area of 9892 sq. km., of which 364.66 sq km. is urban area. As per the 2011 census Nagpur district has a population of 24,05,421; of which male and female are 12,26,610 and 11,78,811 respectively. Due to increase in number of population there has been high increase in number of vehicles plying in the city.

Currently, Electric rickshaws have started getting popular in the city as an alternative to auto rickshaws and pedaled rickshaws because of their low fuel cost and less human effort. They are being widely accepted as an alternative to petrol/diesel/CNG auto rickshaws and are pulled by an electric motor ranging from 650-1400 watts. Battery-run rickshaws could be a complementary transport for the

low-income people who suffer most from a lack of transport facility. They offer huge returns in less time, are easy to operate and have low maintenance and running costs. E rickshaws can provide a decent income since the battery charging cost is far lower than any other fuel.

Rationale of the study:

Nagpur is the second capital of Maharashtra and serves as major commercial, industrial, educational, and medical center. Large chunk of population prefer public transport. The most popular means of transport is city bus service. Lot of people also commutes by auto rickshaw, taxi or the upcoming radio cabs. People also use services of cycle rickshaws for travelling short distances. With growth of the city and increasing traffic, numbers of cycle rickshaws in the city are depleting.

People face lot of problems related to local transportation like non availability of auto/ cycle rickshaw or over priced fares by auto, non availability of bus on some routes or changeover of buses to reach the destination, etc. In such a situation E-rickshaws can be a good option to travel short distances within the city. This study aims at probing into the problems related to local transportation in Nagpur and trying to evaluate feasibility of e- rickshaw as an option.

Objectives:

1. To study the expectations of citizens of Nagpur regarding an ideal local mode of transport.
2. To identify the problems of commuters regarding the present options available for local transportation
3. To analyze the expectations of citizens of Nagpur with regard to E- rickshaw
4. To study the perceived benefits of E- rickshaw

Research Methodology:

Sample frame: Nagpur city

Sample size: 400

Survey description and respondent profile: Sample drawn for this research included respondents belonging to different age groups, gender, professions & variable income levels. Sampling unit consisted of educated, male and female individuals of Nagpur, who may or may not be earning.

Data was gathered using a questionnaire which recorded expectation of citizens from a public transport mode, issues with short distance commuting, like non availability of transport mode when required, high price and lack of adequate service points (bus and rickshaw stands), etc. Perception of people on benefits of e- rickshaw with respect to time, service and cost were also recorded.

Data Analysis & Interpretations:

1. Expectations of citizens of Nagpur from local mode of transport:

Table 1: Expectations from local mode of transport –Overall & Age wise

Expectation factors	Overall expectations	Age Group			
		0 - 15	16 - 25	26 - 55	56 - above
Time Saving	68%	36%	69%	69%	43%
Economical	72%	9%	77%	70%	29%
Easy availability	60%	55%	64%	54%	43%
End to end connectivity	28%	64%	26%	28%	14%
Round the clock service	14%	18%	10%	21%	43%
Eco friendly	40%	55%	34%	49%	71%
Others	0%	0%	0%	0%	0%

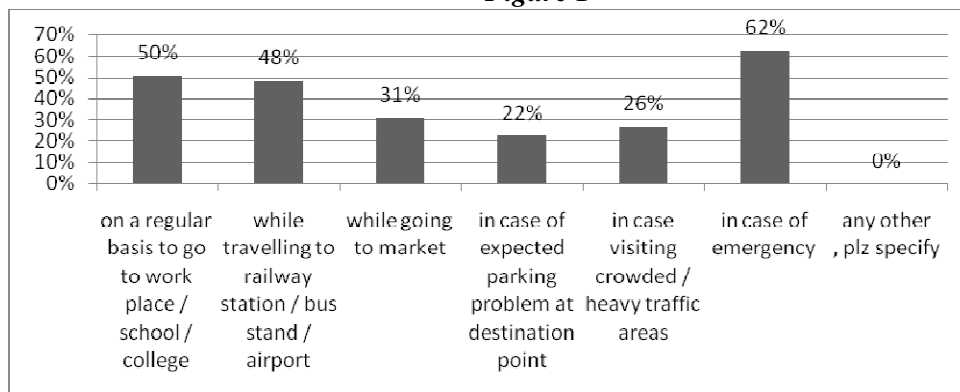
Interpretation:

From the above table we can infer that based on age the expectation from a mode of transport vary with different age group. 64 % respondents in the age group of 0-15 expect end to end connectivity,

77% respondents in the age group of 16-25 expect the transport mode to be economical. In the age group of 26-55, 70% expect the transport mode to be economical and 69 % also prefer time saving mode of transport. Whereas in the age group of 56 yrs and above majority i.e. 71 % respondents have shown highest preference for eco-friendly mode of transport and equal expectation with 43% respondents preferring factors like time saving, economy and round the clock service.

2. Occasions when alternative transport mode is used by people of Nagpur:

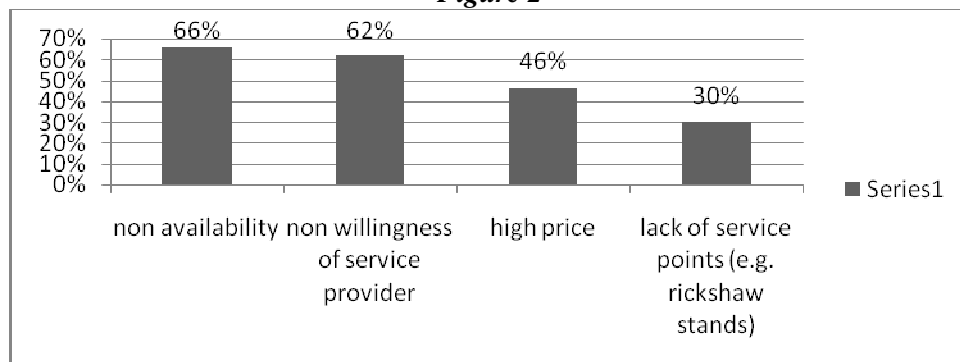
Figure 1



Overall we may infer that highest number of respondents, i.e. 62% use public transport in case of emergency and lowest i.e. just 22% use public vehicle when expecting parking problem at the destination.

3. Various problems faced by commuters while travelling short distances:

Figure 2



66% respondents have reported unavailability and 62% have reported unwillingness of the service provider as the two major problems faced while travelling short distances.

4. Willingness of citizens for e-rickshaw in Nagpur:

Figure 3: Age wise

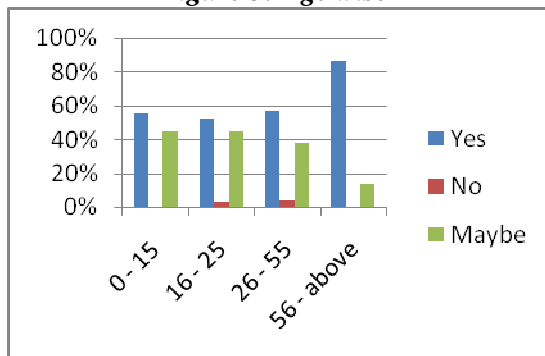
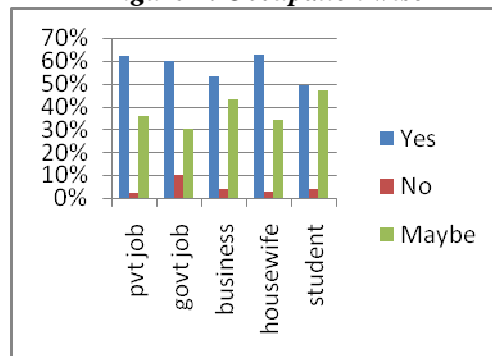


Figure 4: Occupation wise



We can infer from Figure 3 that respondents of all age group show high willingness for having e-rickshaw in Nagpur. Respondents above 56 years of age have shown very high willingness (84%) for e-rickshaws in Nagpur.

From Figure 4 we may infer that respondent of all occupations have similar level of willingness (60%) for e-rickshaw in Nagpur. Government employees have shown highest negative response (10%), as unwillingness.

5. View of respondents on availing e- rickshaw facility:

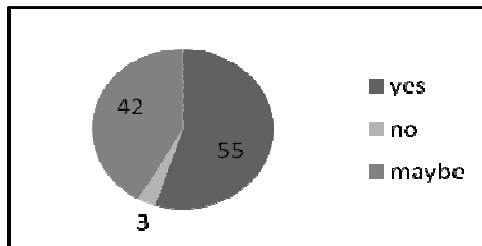


Figure 5: Opinion on availing e- rickshaw facility

From Figure 5 we can infer that overall, 55% respondents show willingness, 42% respondent say maybe and only 3% respondents are not willing to have e- rickshaw in Nagpur.

Table 2: Age wise opinion on availing e-rickshaw facility

	Age Group			
	0 – 15	16 - 25	26 - 55	56 - above
Once in a while to experience the ride	82%	49%	38%	0%
Sometimes for enjoyment	27%	52%	33%	14%
As a regular mode of transport	27%	43%	37%	57%
For convenient - end to end connectivity	45%	33%	41%	57%
For economy	27%	41%	45%	86%
As an alternative to rickshaw	45%	33%	36%	0%
As it would generate employment	27%	18%	23%	0%

From Table 2 we can infer that 82% respondents in the age group of 0-15 year would prefer to avail e-rickshaw facility once in a while to experience the ride, 52% in age group 16-25 years would use e-rickshaw sometimes for enjoyment & 49% from same group would use it once in a while, 45% in age group 26-55 years would use e- rickshaw for economy reasons followed by 41% respondents from same group preferring e-rickshaw for end to end connectivity while 86% from age group 56 years & above would use it for regular transport.

Table 3: Occupation wise opinion on availing e-rickshaw facility

	Occupation				
	Pvt. job	Govt. job	Business	Housewife	Student
Once in a while to experience the ride	49%	10%	35%	46%	50%
Sometimes for enjoyment	38%	20%	35%	40%	52%
As a regular mode of transport	36%	55%	39%	26%	44%
For convenient - end to end connectivity	44%	50%	39%	37%	31%
For economy	40%	50%	39%	60%	41%
As an alternative to rickshaw	34%	45%	27%	31%	34%
As it would generate employment	16%	20%	25%	29%	17%

From Table 3 we infer that 49% respondents with private job would use e-rickshaw once in a while to experience ride, 55% respondents in government jobs would use e-rickshaw as a regular mode of transport, 39% business men would use e-rickshaw as a regular mode of transport, for convenience & also

for economy reasons; 60% housewives would use it for economy reasons and students would mainly use it for enjoyment and for ride once in a while.

Figure 6: Overall opinion on availing e-rickshaw facility

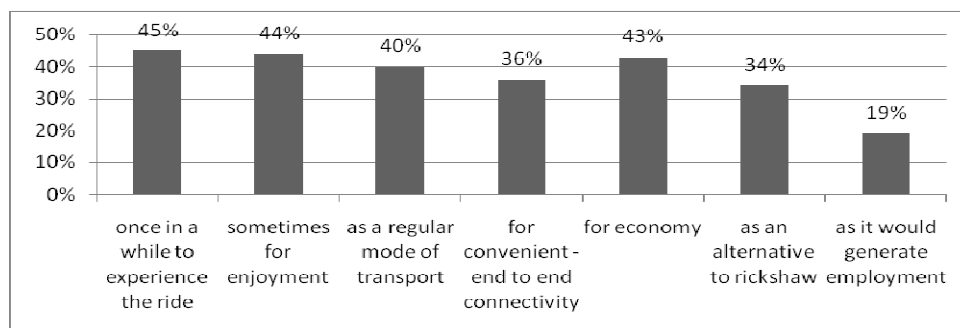
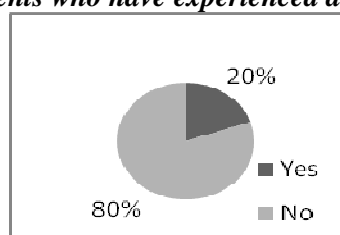


Figure 6 indicates that overall 45% respondents would use e-rickshaw once in awhile for experience, 44% will use it for enjoyment, 43% would use for economy reason, 36% would use for convenience and only 19% would use it as it would be a source of employment generation.

6. Experience of respondents, who have travelled by e-rickshaw, on various parameters:

Figure 7: Respondents who have experienced an e-rickshaw drive



From Figure 7 we can say that only 20% respondents have experienced an e-rickshaw ride while 80% have not had this experience.

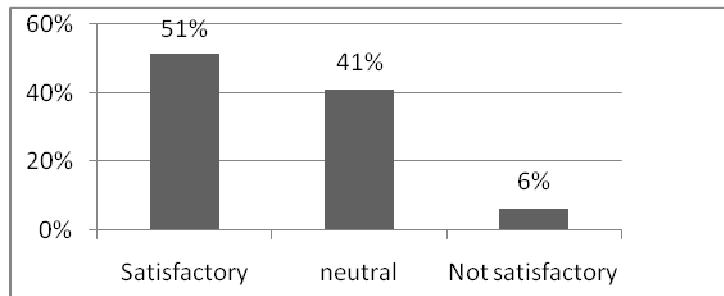
Table 4: Age-wise satisfaction of respondents (on various parameters) who have experienced e-rickshaw ride

	0 - 15	16 - 25	26 - 55	56 - above
Time				
Satisfied	100%	64%	34%	50%
Neutral	0%	31%	54%	50%
Not satisfied	0%	5%	9%	0%
Service				
Satisfactory	0%	38%	49%	100%
Neutral	100%	59%	43%	0%
Not satisfactory	0%	3%	6%	0%
Cost				
Satisfactory	50%	33%	54%	100%
Neutral	0%	46%	37%	0%
Not satisfactory	50%	21%	6%	0%

Table 4 indicates that 100 % respondents in the age group 0-15 years are satisfied with time taken for travel by e-rickshaw, 100% are neutral about service, 50 % are satisfied with cost and 50% are not satisfied with cost factor of an e- rickshaw. In the age group 16-25 years majority of respondents (64%) are satisfied with the time factor, 59% respondents are neutral about service and 46% are again neutral about cost factor related to e- rickshaw ride. In the age group 26-55 years, 54% respondents are neutral

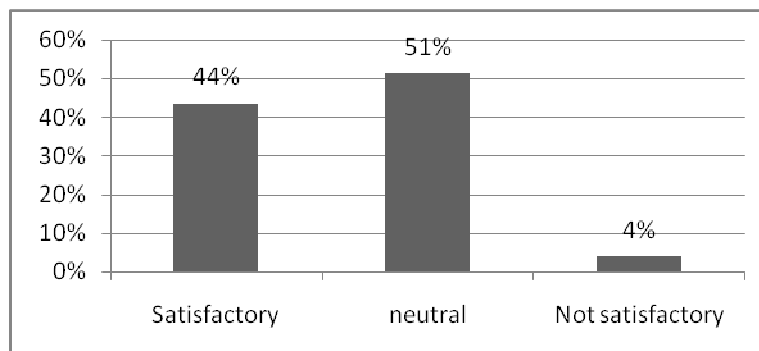
about time factor, 49 % are satisfied with service factor and 54% are satisfied with cost factor. In the age group of 56 & above 50% are satisfied with time factor and 100% are satisfied with service and cost factor of an e- rickshaw ride.

Figure 8: Overall satisfaction (on time taken) of all respondents who have experienced e-rickshaw ride



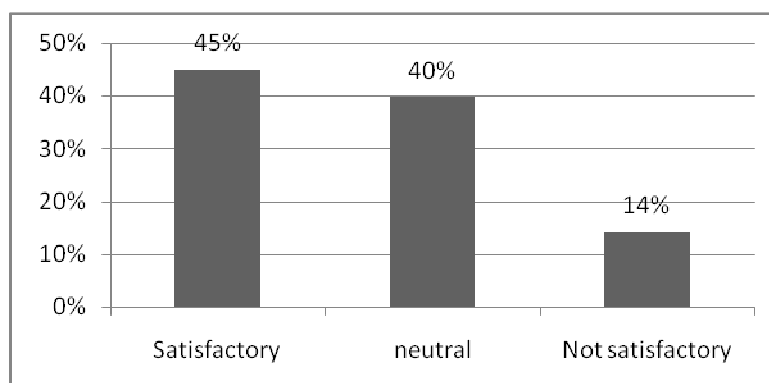
From figure 8 we can infer that 51% of total respondents are satisfied with the time factor of an e-rickshaw ride while 41% are neutral with time involved in an e-rickshaw ride. Only 6% are not satisfied.

Figure 9: Overall satisfaction (on service) of all respondents who have experienced e-rickshaw ride



From figure 9, above, we can infer that 51% of total respondents are neutral about the service factor of an e-rickshaw ride while 44% are satisfied with it and only 4% are not satisfied with the service of an e-rickshaw.

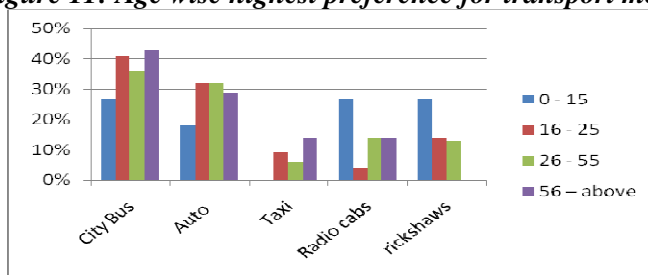
Figure 10: Overall satisfaction (on cost) of all respondents who have experienced e-rickshaw ride



From figure 10 we can infer that 45% of total respondents are satisfied with the cost factor of an e-rickshaw ride while 40% are neutral and 14% are not satisfied.

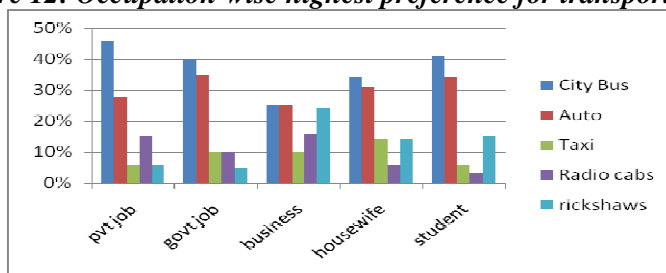
7. Preferred mode of transport:

Figure 11: Age wise highest preference for transport mode



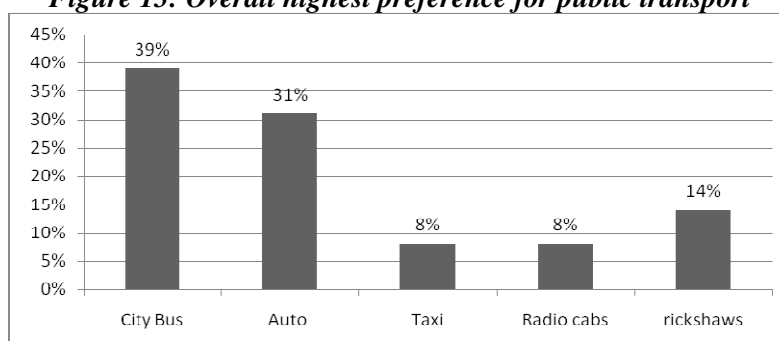
From figure 11 we can interpret that among all the age groups the highest percentage of respondents are those who prefer city bus the most. In age group 0-15 years, 27% respondents prefer city bus, radio cabs & rickshaws over other mode of transport. In this age group the least preferred mode is taxi. In the age group 16-25 years, maximum numbers of respondents (41%) prefer city bus and this age group has the lowest preference for radio cabs. In the age group 26- 55 years, the least preferred mode of transport is taxi and in the age group of 56 and above the least preferred mode is rickshaw.

Figure 12: Occupation-wise highest preference for transport mode



From figure 12 we can interpret that based on occupation, maximum number of respondents have indicated city bus as the most preferred mode of public transport. Only 6% respondents having private jobs have preferred taxi and auto as modes of transport. The government employees show least preference for rickshaw (4%). Among businessmen 25% prefer city bus and only 10% prefer taxi. Among housewives, highest preference is given for city bus (34%) and lowest preference for radio cabs (6%). In case of students, highest preference (41%) is towards city bus and lowest (3%) is for radio cabs.

Figure 13: Overall highest preference for public transport



Overall response from all the respondents shows (figure 13) highest preference for city bus at 39% followed by auto at 31% and the least preferred mode of transport is indicated as taxi and radio cab (both at only 8%).

Findings & Conclusions:

1. **Expectation of citizens of Nagpur from a public transport mode:** Expectations of people vary with age. Some factors are most important for a particular age group while the same factor may not be important for another age group. While the youngsters give great importance to end to end

connectivity (64%) and also want economical mode of transport (77% in 16-25 years age group), the seniors give highest preference to eco friendliness of the transport mode (71%) along with economy. The working class age groups give highest preference to time saving mode.

- 2. Problems of short distance commuters:** Short distance commuters have various problems such as non availability of transport when required (66%), problems related to service providers like unwillingness (62%) and non-adherence to time schedule, high price (46%) & lack of adequate service points (32%) - bus & rickshaw stands.

The most preferred mode of transport, in general, is the city bus (39%) followed by auto (31%) and then rickshaw (14%). Thus it may be inferred that these problems are related to bus service with respect to non availability of bus on desired routes or at desired time and problem with auto rickshaw related to unwillingness of the driver to travel as desired by the commuters.

- 3. Expectations of citizens of Nagpur with regard to e-rickshaw:** In general most of the respondents use public transport in case of emergency (62%) and to visit railway station/bus stand/airport (48%). People give maximum preference to use of public transport to visit places facing parking problems (22%). People would prefer using public transport in case of emergency and occasionally based on need. Thus easy availability of e-rickshaw at the time of need is of great importance for travelers.
- 4. Perceived benefit of e-rickshaw:** Perceived benefits of e-rickshaw are on three factors - they are time, service and cost. Out of these respondents 51% respondents are satisfied with time factor, 44% respondents are satisfied with service factor and 45% respondents are satisfied with cost factor involved with e-rickshaw ride. Based on this we may conclude that the travelers perceive high benefit from e-rickshaw, with respect to time, service and cost.
- 5. Willingness of citizens to avail of e-rickshaw facility:** It is concluded that all respondents show a high willingness towards having e-rickshaw in Nagpur – 55% say ‘yes’ and 42% say ‘may be’. They show high level of willingness for operation & preference to e-rickshaw in Nagpur.

Suggestions:

Based on the above study and analysis of the data obtained the researcher has put up some suggestions regarding e-rickshaw in Nagpur, which are as follows:

1. It is suggested that e-rickshaw may be introduced in Nagpur in areas where there is low frequency of bus service.
2. Routes may be identified for operation of e-rickshaw and they may ply on those fixed routes. These routes may be the ones on which bus service cannot be provided at a high frequency due to various constraints.
3. E-rickshaw stands may be formed, where e-rickshaws may be made available to the travelers throughout the day (at least 16 hours).
4. The e-rickshaw stands also have prepaid counters to monitor the availability and fares charged to travelers.
5. Meters may be fixed or rate cards may be prepared for fare to be charged to the travelers. This will create an atmosphere of trust.

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