Dear TRAI,

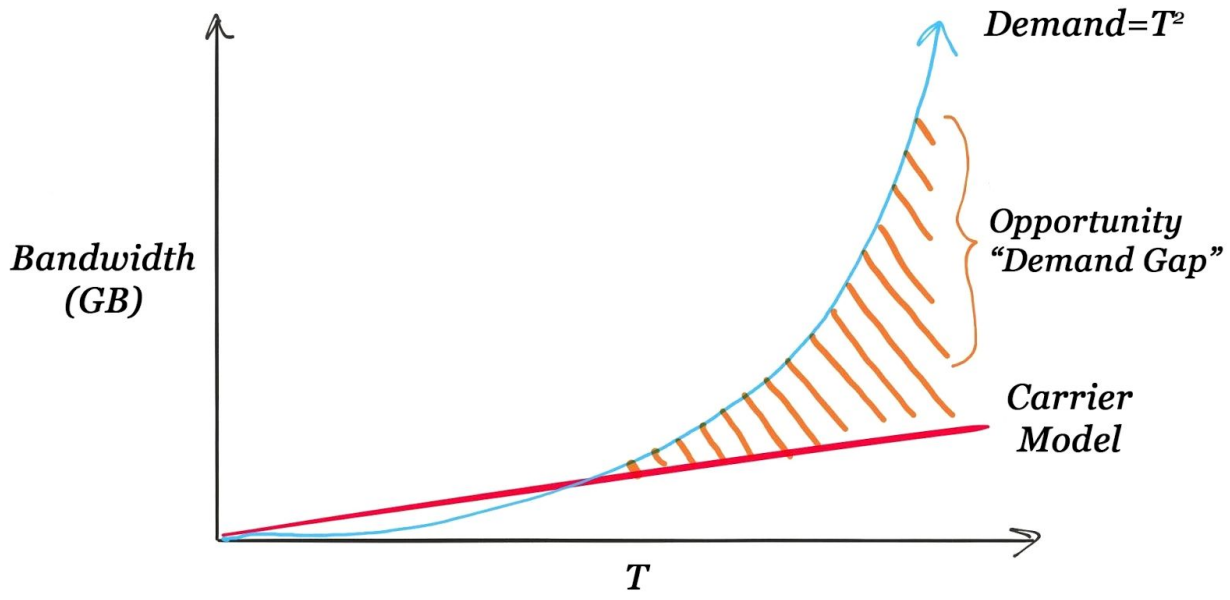
I work at Ola Cabs Research & Innovation Labs, but write as a private individual. I am extremely passionate about the Internet, and want to see a world where Free Internet reaches the poorest of people. I have spent over half my life working in internet, and several years in San Francisco designing hardware and software that lets anyone build Internet. That software, FireChat, received over 10m downloads, and let anyone (even children) build basic wireless "Mesh" infrastructure with their smartphones.

We live in an age where building internet is incredibly easy, even children can do it. At FireChat we saw students building networks at their schools. If we enable the proper economic and political environment for anyone to build internet, Digital India will become the global leader in innovation.

Any attempt to restrict the Internet in regards to discriminating bandwidth, harming net neutrality and restricting ISP competition will **Severely Harm the Indian People and Their Economy**. I come from San Francisco where monopolies have destroyed the free internet, charging over 1000Rs per GB, and delivering speeds I have seen faster on 3G here in rural India. Campaigns like Free Basics scour the country. Innovators like Netflix must pay to stream data, leaving smaller startups unable to compete. Today, the Internet is broken.

Internet is rationed, throttled, censored and used as a tool of economic slavery. Internet today is the tool of an economic and digital caste system. This makes the poor slaves to the networks. Those unable to afford a connection are left out of the global conversation. Those unable to afford lose out on job opportunities, knowledge, and access to the truth. India is leading in its Internet. Together, we can make it even faster and more affordable.

Today, as Internet demand doubles each year, the ISP "Carrier model" cannot scale to 1.3 Billion Indians. Carriers struggle to meet demand and expand infrastructure. The result is high Internet costs for everyone. A substantial bandwidth gap exists between demand, and what can be delivered by carriers. If TRAI supports startups and ISP competition, this "Demand gap" will create tremendous opportunity, new startups, economic prosperity, and low cost Internet for the poor.



The United Nations states that Internet access create jobs, stimulates economic development, and is a basic right for every human on Earth. India is already a leader in affordable Internet, TRAI can foster this growth.

Geographic ISP monopolies, and restrictions to backbone access make Internet more expensive. As a result these monopolies restrict economic development, harm job growth, and negatively impact national education. Internet Legislation in favour of the ISPs harm the parts of India that need economic prosperity the most. A new model is required to bring internet to those who need it most:

Wireless hardware has become so cheap and easy to use, that even children can easily deploy infrastructure, like Wi-Fi hotspots. An economic model is needed to enable anyone to deploy Wi-Fi in villages, slums, and low income areas. Government ISP legislation and restrictions to geographic competition keep infrastructure prices prohibitively high, and restrict the poor from reselling data. TRAI can change the lives of millions.

Digital India must enable anyone (Including children) to resell data from any Internet connection. ISPs must not prohibit this reselling or discriminate between private and public Wi-Fi Connections.

A future where anyone, a child, a student, a single mother, or an elder, can set up and profit from their own wireless infrastructure is here, but only if the government allows it.

You are the Internet. Child holding a Last Mile Wireless Antenna. Future hardware will require the child to simply plug in the hardware, or expose a PV to sunlight. (Costs about as much as a smartphone, or textbooks. (~2000 Rs) delivering ~10mb/s per user)

In the past, shops set up payphones, today they can set up Wi-Fi. This promotes competition, better Quality of Service, and lower prices for those who need it most.

Ola Cabs is the perfect case study for Digital India's leading way of thinking. What if we applied this ride-sharing model to the Internet? Instead of people running their own cars they run their own Wi-Fi hotspots? Or maintain their own last mile infrastructure?

We need to create an economic incentive for anyone to profit from building last mile infrastructure and wireless access points. A payphone is perfect historic example. Today, we can build Wireless infrastructure for cheaper than a payphone cost in the 1990s, or even cheaper than textbooks cost today.

By applying this Ola “Ride Sharing” model to Internet, Anyone can profit from running a Wi-Fi access point. We can create economic incentive for someone to set up an AP in a slum, or rural village. These incentives will enable the poorest to access Internet at a fraction of the cost of a 4G carrier.

Here is our overview of what we recommend to spawn the expansion of Wi-Fi and Digital India:

A. In order for public Wi-Fi to spread across India, there must be the economic incentive to self-sustainably support this rollout. Wi-Fi Hotspots must be unlicensed and profitable. This means **anyone must be able to resell their internet connection without a license**. Children should be legally able to do this with no paperwork involved.

B. ISPs cannot prohibit the reselling or prohibit the sharing of internet connections. This includes discriminative pricing between private and public Wi-Fi connections. If ISPs control, discriminate, and restrict the costs of backbone access, profit models for Wi-Fi hotspots will be destroyed. This will make hotspots prohibitively expensive to access, and deploy. TRAI must take action to make sure cost of access (Wired or wireless) is competitive and affordable.

C. One Wi-Fi hotspot should not be treated differently than 2 or 10 hotspots connected to each other. This creates the economic and legal framework for anyone to build village-wide Wi-Fi networks (Like AirJaldi in Dharamshala, or MonkeyBrains in San Francisco). In San Francisco, currently the best way to get online is through MonkeyBrain's rooftop Wi-Fi network. Students all over the world are building these networks quite easily, but ISP licences are prohibitively expensive. Let's remove the economic and political barriers to entry for these young networks, enabling anyone to build last mile infrastructure.

D. India must recognize Internationally accepted ISM 24GHz and 60GHz (60GHz is the new standard for Wi-Fi appearing in modern smartphones). This opens the doors for DIY Gigabit Wi-Fi Infrastructure. Hardware/software are at a point where children can build internet infrastructure.

E. Payments should be left up to "Wi-Fi Provider". 1GB of data will soon be ridiculously cheap, let's not lock legislation into the idea that the Internet shouldn't be free. India is Cash first, any centralized billing makes this difficult to innovate and adapt.

F. Verification requirements impede those who need Internet most from accessing education, opportunity, and becoming part of Digital India. Millions of Indians are undocumented, or simply cannot afford to pay for SMS verification. Know Your Customer is an economic impediment to free speech, impeding access to education, and the creation of a Digital India. Surveillance poses impediments on those who need Internet access most, for example low Income Indians, rural villages, and children.

I. Verification increases setting up costs as Wi-Fi provider must set up a way to manage every user. This means expensive hardware and software. This also creates security concerns over who manages this database.

II. Verification and OTP significantly increases running costs. 1 Rs for SMS verification could be used for data, adding up quickly. This creates tremendous cost, resulting in more expensive data for everyone.

III. Verification excludes potential customers that cannot afford SMS connection or have no documentation. These are the Indians that can benefit most from Internet

IV. Login becomes cumbersome, as one must be within a cell network to access a remote Wi-Fi AP. This also excluded people without mobiles, for example tourists. This makes India appear less connected than it actually is. For example Hong Kong has a brilliant open, free Wi-Fi at their Airport, making HK appear highly advanced. This is illegal today in India.

V. Security Impact of authentication is wildly exaggerated.

A: Those committing serious crime will be able to easily use forged identity documents; the neighborhood mobile shop or hotspot operator has no training or incentive to spot these forgeries

B: Privacy-conscious individuals, including (but certainly not limited to) those engaged in illegal activity, can use software like TOR, VPNs and encrypted proxy servers

to make it impossible to connect their online activity to the hotspot they are using. This is as simple as downloading an app.

It cannot be illegal to provide access to deprived citizens, especially before they are documented or within cellular service. Surveillance poses impediments on those who need Internet access most, for example low Income Indians, rural villages, and children.

Creating legislation in favor of ISPs that ensure "a return on investment" is detrimental to the Indian economy and will result in putting India far behind the rest of the world. Europe is a great example where carriers are holding 5G rollout for ransom, asking the government to cripple net neutrality so ISPs can have a "profitable environment" to rollout new technology. India is allready ahead, let's bring Internet to the poorest parts of Digital India.

The carrier model is clearly broken, prioritising profits over data speeds, and rollout of new technology. The Carrier model cannot sustainably provide affordable Internet to 1.3 billion Indians. TRAI can foster a new model with Wi-Fi, and enabling anyone to build last mile connections.

TRAI will foster innovation and competition in how India accesses the internet, encouraging countless new startups, millions of jobs, and economic development Pan-India. I'm going to bring the Internet to every slum and village. It will be up to you to create the environment to foster innovation, and education for billions.

Thank you,

Garrett E Kinsman
Bangalore, India
9 August, 2016

Q1. Are there any regulatory issues, licensing restrictions or other factors that are hampering the growth of public Wi-Fi services in the country?

Public Wi-Fi is restricted by requirements to log user's data, phone number, and create OTP. Anyone without a mobile number, Ex: children, extreme poor now cannot benefit from these networks (80% of Android phones have no sim). Verification makes rollout cumbersome and expensive. ISPs also generally do not allow public Wi-Fi in their terms of service. Reselling of Wi-Fi is also Illegal (requiring an ISP licence), hampering the economic sustainability of Public Wi-Fi rollout.

Thinking of Wi-Fi as last mile infrastructure that anyone can deploy will promote Digital India for all.

Q2. What regulatory/licensing or policy measures are required to encourage the deployment of commercial models for ubiquitous city-wide Wi-Fi networks as well as expansion of Wi-Fi networks in remote or rural areas?

It must be legal to Resell Wi-Fi from any Internet Connection. Carriers cannot prohibit the resale or sharing of an Internet connection. This includes ISPs discriminating between private and public data plans. This discrimination would make Public Wi-Fi prohibitively expensive. Login is also a challenge as many people may have an Android phone, but do not have a SIM. Wi-Fi should be open to everyone, without OTP, especially in areas without cell service. This enables even the poorest of India take part in Digital India.

Q3. What measures are required to encourage interoperability between the Wi-Fi networks of different service providers, both within the country and internationally?

Because phone numbers change, and many cannot afford a SIM, OTP is a poor method of Identification. Login should be up to Wi-Fi provider. Open, Free networks makes this very simple to enable, as each provider can have a different and competitive model to charge.

Q4. What measures are required to encourage interoperability between cellular and Wi-Fi networks?

Cellular and Wi-Fi should be treated separately and both have completely different financial models. Any attempts to control and regulate identification of users will hamper innovation and competition in deploying Wi-Fi. This will result in harming the poor and youth of Digital India.

Q5. Apart from frequency bands already recommended by TRAI to DoT, are there additional bands which need to be de-licensed in order to expedite the penetration of broadband using Wi-Fi technology? Please provide international examples, if any, in support of your answer.

ISM 23GHz and 60GHz are internationally recognised as part of Wi-Fi. India must recognise these bands, as they are included in modern smartphones. This enables Gigabit data transmission very inexpensively. 902-928 MHz is unlicenced in USA, enabling low bandwidth data to be deployed to remote regions. Modern hardware is also enabling anyone to utilize these spectrum at very low cost. Any spectrum (For example Whitespace) that can be opened to startups will enable competition for Internet and benefit Digital India through lower costs of access. Today “spectrum crunch” is used globally to create artificial bandwidth deficit which is harming the Indian people and economy. India has tremendous amounts of unused spectrum, this can be used to create affordable access for all.

Q6. Are there any challenges being faced in the login/authentication procedure for access to Wi-Fi hotspots? In what ways can the process be simplified to provide frictionless access to public Wi-Fi hotspots, for domestic users as well as foreign tourists?

In order for Wi-Fi to impact those who need it most (Those who cannot afford SMS connection or those undocumented in rural India), Login should be open to enable anyone to connect automatically. Removing customer identification is normal for United states and Hong Kong.

Q7. Are there any challenges being faced in making payments for access to Wi-Fi hotspots? Please elaborate and suggest a payment arrangement which will offer frictionless and secured payment for the access of Wi-Fi services.

India is a cash first economy, making payments up to the Wi-Fi provider will enhance the effectiveness and speed the rollout of public Wi-Fi. Eventually data will be so cheap, that billing for low bandwidth data will become a hassle.

Q8. Is there a need to adopt a hub-based model along the lines suggested by the WBA, where a central third party AAA (Authentication, Authorization and Accounting) hub will facilitate interconnection, authentication and payments? Who should own and control the hub? Should the hub operator be subject to any regulations to ensure service standards, data protection, etc?

Q9. Is there a need for ISPs/ the proposed hub operator to adopt the Unified Payment Interface (UPI) or other similar payment platforms for easy subscription of Wi-Fi access? Who should own and control such payment platforms? Please give full details in support of your answer.

There should be no centralized entity for Digital India's Wi-Fi. Any attempts to centralize payment or authentication for users will create barriers for startups to create new models to innovate and bring Indians online. We want to enable as much competition as possible, and maximise innovation for Wi-Fi providers. Removing authentication makes it easier to deploy Wi-Fi, and for children and the extreme poor to get online and access education.

Q10. Is it feasible to have an architecture wherein a common grid can be created through which any small entity can become a data service provider and able to share its available data to any consumer or user?

Yes, but this should be left up to common Wi-Fi standards. For example, in Dharamshala AirJaldi uses Wi-Fi to connect whole villages to internet. Encouraging these entities to expand without licences will enable Internet to spread across rural India. The internet is so fast in Dharamshala that tourist from all over the world travel to India to work remotely. ISP licences and restrictions hamper these networks from expanding and create financial hardships.

Q11. What regulatory/licensing measures are required to develop such architecture? Is this a right time to allow such reselling of data to ensure affordable data tariff to public, ensure ubiquitous presence of Wi-Fi Network and allow innovation in the market?

Opening up more unlicensed spectrum and removing any licences to deploy wi-Fi will enable anyone, even children, to build Wi-Fi networks. Today is exactly the right time to enable reselling of data from wireline or wireless connections. Removing the differentiation between a single Wi-Fi network and several connected to each other will enable anyone to connect whole villages to Wi-Fi for only a few thousand Rupees. The major cost now lies in ISPs controlling backbone fiber access.

Q12. What measures are required to promote hosting of data of community interest at local level to reduce cost of data to the consumers?

Removing barriers to entry for local hosting applications and ISPs will create competition with tremendous opportunity for new startups and the the indian people.

Q13. Any other issue related to the matter of Consultation

TRAI can support legislation to promote the profitability of Carriers, or TRAI can support competition, innovation and the expansion of the Digital India we have come to know and love. The future is for 1.3 billion indians to create, let's initiate the building blocks for our children and people to build the future of the Internet.

Thank you for your time,

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A few Resources:
https://en.wikipedia.org/wiki/Right_to_Internet_access

http://www.theverge.com/2016/7/10/12139700/telecom-companies-5g-service-european-union-net-neutrality