RESEARCH ARTICLE

Reimagining the peripheral ring road of Bengaluru as an area development project

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Abstract: Bengaluru City's Peripheral Ring Road (PRR), a project announced back in 2005 has faced several impediments to its implementation largely due to land acquisition hurdles, associated cost overruns and stakeholder dissent. This paper addresses the state of the practice in the way the ring road was imagined, why the project has remained unimplemented in over a decade and the possible alternatives by which it could be better planned and financed. Findings suggest that the crux of the problem could be attributed to a failure in recognising the full potential of a ring road to the city. Envisioned as a mere bypass to 'decongest an already crowded Outer Ring Road (ORR), to prevent long distance private vehicles from entering the city centre' its potential for area development, planned urban expansion and to serve as an ideal tool for land value capture were not recognised. Experiences of other cities which have been more successful in implementing similar projects through the use of alternative means of accessing land for public purposes provides clues to achieve that elusive middle ground between all stakeholders.
Keywords: ring road, serviced land, value capture, readjustment, participation

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1 Bengaluru – Economic Growth Unmatched by Infrastructure Investment

The State of Karnataka aspires to be a 700 billion US$ economy by the year 2035 from its current 120 billion US$ economy[1]. Bengaluru is the economic powerhouse of the State and the fifth most preferred destination worldwide for multinational corporations to set up after Silicon Valley, London, Paris and Singapore. The Bengaluru Metropolitan Region (BMR) contributes to 37% of Karnataka's income (2012−2013) despite an occupation of only 4% of the State's area, and 19% of its population[2]. Public investments in infrastructure are the base of a robust economy. Ample literature indicates the beneficial impacts particularly of road development in terms of productivity, production, market access and even poverty reduction; also access to jobs, education and healthcare all indicating the positive correlation between transport investments and economic outputs. Transport infrastructure in Bengaluru however, has been unable to keep pace with its rampant growth.

The BMR is intercepted by 2 National Expressways, 3 National Highways and 12 state highways connecting major towns and cities within BMR and beyond. The radial road network in the BMR converges into the core and contains centre-periphery traffic, as well as transit traffic that converges at and congests the city centre. The city is plagued with decreasing travel speeds and increasing travel distances.

Bengaluru has been attempting to complete several large ring road projects to improve its city-region connectivity and alleviate traffic congestion. A series of ring roads namely, the Satellite Town Ring Road (STRR), Intermediate Ring Road (IRR), Peripheral Ring Road (PRR) and Town Ring Roads (TRR) have been envisaged. The NICE Corridor[1] implementation was also undertaken of which the southern arc has been constructed[3] (Figure 1).

Several or rather all of these ring road projects are incomplete or have been stalled due to land acquisition hurdles, and cost and time over runs. The STRR for example, proposed in 2006, had its land acquisition cost estimated at Rs. 741 crores in 2007, which increased to Rs. 2,872 crores in 2012[4] and continues to escalate causing the agency to rethink its approach. Projects such as the Bengaluru Metro Rail Project (Namma Metro), which was conceived almost 9 years ago, also faced prolonged delays due to litigation against land acquisition. The PRR which is the focus of this paper and conceived by the Bangalore

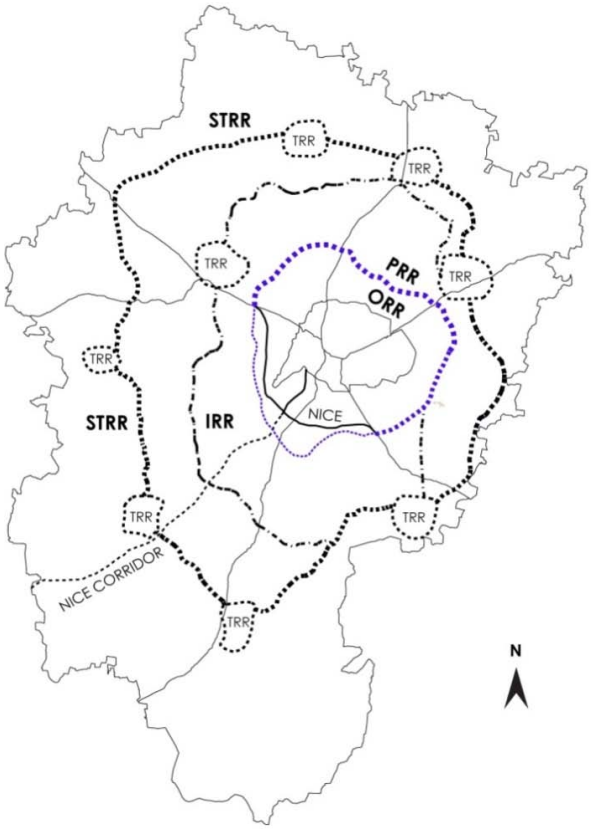

Figure 1. Indicative proposed ring road alignments in Bengaluru Metropolitan Region (BMR).
Source - WRI India
Data Source: BMRDA Revised Structure Plan 2031

Development Authority (BDA) in 2005 too languishes, with the agency stating financial inability to meet the high costs of land acquisition related compensation.

2 Scope, Limitations and Method

This paper is conceived as a practice note and hence it specifically addresses experiences related to the PRR in the context of Bengaluru and any recommendations or lessons presented are narrowly tailored to this particular case. With the PRR stalled indefinitely, a request was made by the Karnataka State Government to address possible ways out of the deadlock. A presentation was made on the same, the content of which has been drawn into this paper. The paper is targeted at public agencies in the city tasked with implementing the PRR, as well as to those tasked with making decisions on its future.

The paper suggests methods and strategies that offer area development opportunities and cost recovery methods through the use of alternative mechanisms rather than the sole use of compulsory acquisition of land for implementing the project. It examines the current approach of developing the ring road as a mere strip of road involving large capital investments for land acquisition and project execution. Data and research is limited to that available in the public domain. This includes accessing government websites such as that of the Bangalore Development Authority which is the implementing agency, journals, research papers, open source maps and various newspaper accounts on the progress of the project. Projects of similar scale and nature from other cities in India are also assessed to understand related aspects of success or failure.

3 PRR – The Long Road to the Project's Deadlock

3.1 Vision, Justification and Project Details

The Bangalore Development Authority (BDA) is the agency that prepares the long range master plan for the city of Bengaluru and is also tasked with implementing large road infrastructure projects such as the city's ambitious PRR. Studies by the BDA indicated that the population of Bengaluru was around 84.25 lakhs (as per census 2011) spread over 821 km^2, and had an annual growth rate of 3.25%. However, vehicular growth was leaping ahead at 10.2% annually. The last constructed ring road for the city known as the Outer Ring Road (ORR) with a length of about 65 km was also built by the BDA. The ORR was constructed as a bypass to the city for commercial vehicles and long distance personal vehicles. Rapid ribbon development led to increased traffic on ORR and its interconnected roads, and solutions such as grade separators were proving insufficient. In order to provide a bypass to the through traffic going across the city, and relieve the congestion of the ORR the need for a second ring road was felt and was envisioned as a 'direct corridor passage'. This second ring road, referred to as the PRR was initially imagined to be a ring around the city with an approximate radius of 17 to 25 km with a total length of 116 km[5].

The BDA's Master Plan for the city (RMP 2015) largely used this proposed PRR alignment as its conurbation limit (Figure 2), with various land uses being assigned inside of it and the outside being predominantly designated as agricultural lands and green belts. Due to an already implemented half loop (51 km length) towards the south of the city by the NICE Corridor project; it was decided to only construct the northern loop of the PRR which would then form a ring with the NICE project. The State government had granted permission to the BDA to take loan assistance from Japan International Cooperation Agency (JICA) to complete the northern loop. The total length of the PRR hence proposed for construction was 65.55 km with a proposed Right of Way (RoW) of 100 m which includes a 12 m wide central median and 9 m service roads on either side[5] (Figure 3 and 4). The land for developing the PRR was to be acquired using provisions of the BDA

Act in conformity with the erstwhile Land Acquisition Act (LAA) of 1894 and subsequently the new Act of 2013. This enabled the authority to enter into agreements with land owners to compulsorily purchase the land. Spread out across 67 villages, the land requirement for this alignment was estimated to be 8.04 km^2 (Table 1). Of this total land, 11% belongs to the government and 89% to private owners. In the 676 land parcels, covering an area of 7.17 km^2, that fall within the proposed corridor, agricultural land constituted 78% of the land use, followed by residential use at 21% and the remaining is commercial or mixed use (Table 2)[5].

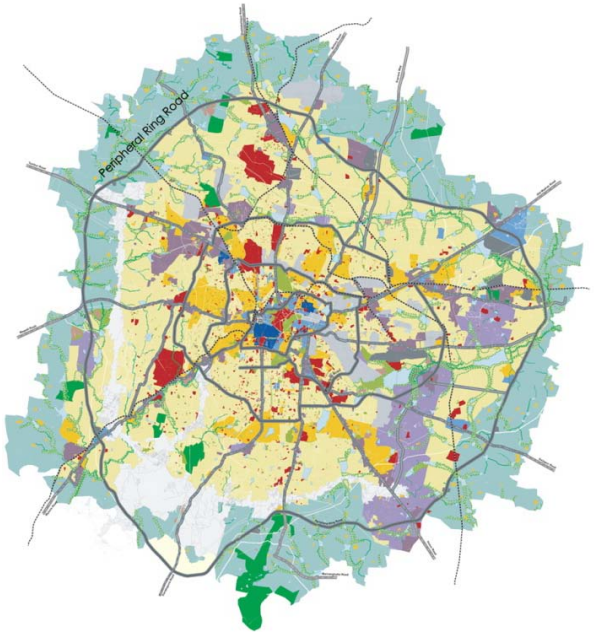

Figure 2. The PRR alignment served broadly as Bengaluru City's conurbation limit.
Source: Bengaluru Revised Master Plan (RMP 2015, Volume 2)

Table 1. Land requirements for the PRR[5].

Particulars	Amount of land	
	km^2	%
Extent of land required for 100 m^2 wide corridor for a length of 65 km	8.04	100
Government land coming under project	0.87	11
Private land required for the project	7.17	89

The project was initially to be implemented through a Build Own Operate Transfer (BOOT) model of PPP, wherein the revenues to the developer would accrue in the form of an annuity payment spaced over the concession period[6]. The identified land was to be supplied by the BDA though this acquisition is yet to be completed and faces numerous court cases pertaining to titles and sharing of benefits. The delay in acquisition of land and its subsequent development has caused discontent among the land owners resulting in cooperation issues. In some places people have boycotted the process altogether[5].

Table 2. Type of affected land parcels[5].

Category of land use	Land parcels			
	Number	%	Completely lost	Partially lost
Residential	143	21.15	18	125
Commercial	3	0.45	1	2
Residential cum commercial	5	0.74	1	4
Agriculture	525	77.66	236	289
Total	676	100.00	256	420

3.2 Implementation Options Attempted and Related Resentment

3.2.1 Compulsory Acquisition under the BDA Act using provisions of LAA, 1894

As the project was conceived more than a decade ago (Figure 5), the BDA initially chose the provisions of the erstwhile Land Acquisition Act (LAA) 1894 which relates to the use of eminent domain. The acquisition process faced litigations and protests from the land owning farmers, since the compensation offered was much lower than the market value of land and the post development value of land was not considered in evaluating compensation. These protests and litigations severely hampered the project's delivery. The root of the problem, as per the BDA[5], lay in the challenges associated with identification of project affected families/persons. Challenges included wrongful listing of both affected and unaffected farmers, majority land owners were absentees not residing in the project area and their whereabouts were not available/known in the villages etc.

3.2.2 Method of Transferable Development Rights

To solve the challenges associated with compulsory land acquisition as stated earlier, the BDA, in 2011, proposed to compensate the property/land owners through transferable development rights (TDR), where development rights were granted as a nonmonetary compensation for the land surrendered. The BDA has in the past used the provisions of TDR for implementation of road projects and other master plan proposals within the city of Bengaluru with varying degrees of success. The BDA intended to use TDR by artificially lowering the Floor Area Ratio (FAR) of the core city to 1. This, the BDA believed, would create a lucrative market for TDR in the city, as additional development rights in excess of what is permitted had to be purchased. The BDA has so far failed to convince the land losing farmers to opt for TDR as a mode of compensation[7].

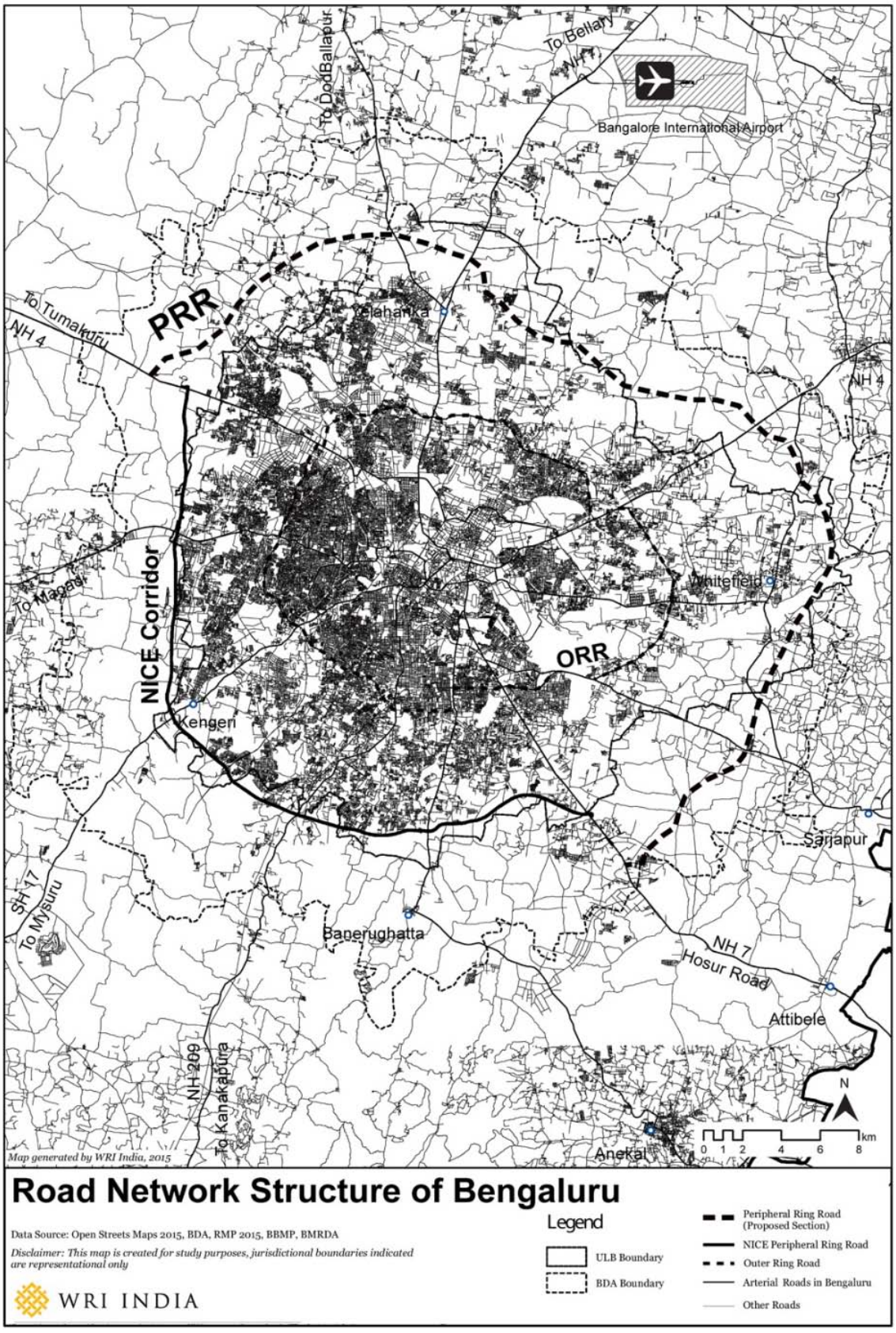

Figure 3. Road Network Structure of Bengaluru.

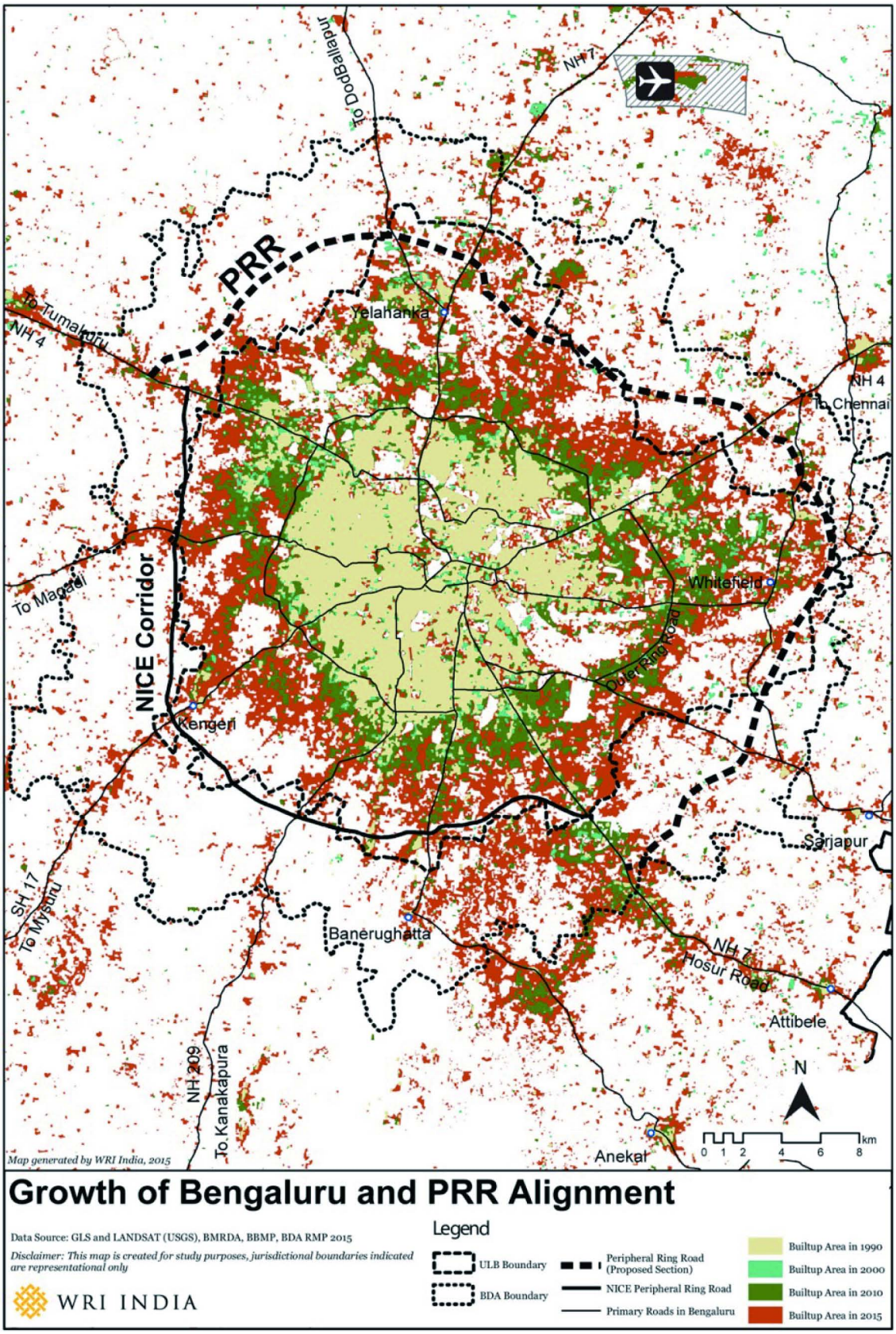

Figure 4. Growth of Bengaluru and proposed PRR Alignment.

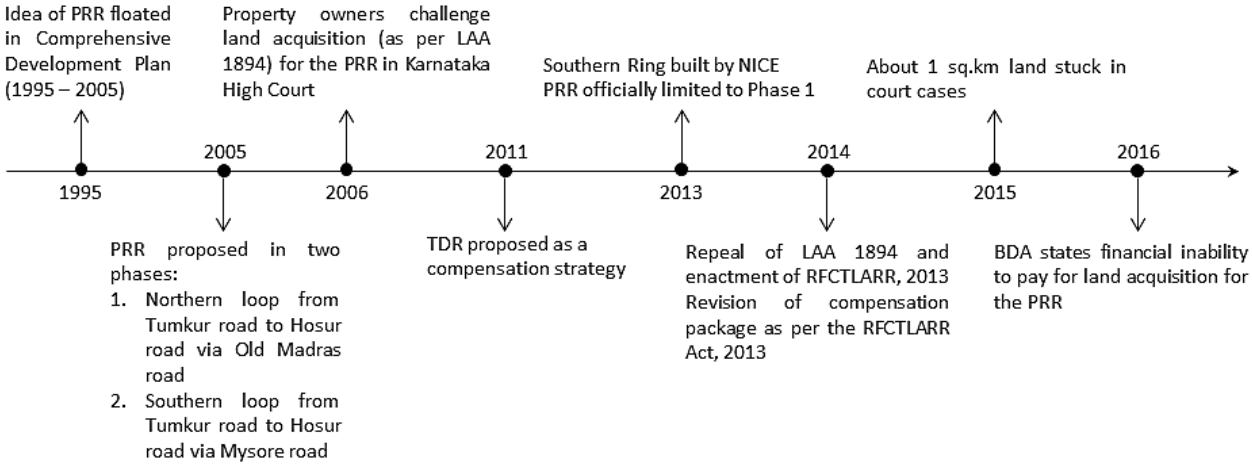

Figure 5. Milestones in the PRR project.
Source: WRI India, data source (5) and other secondary sources

3.2.3 Revised Compensation Strategy as per the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013

Compulsory acquisition of land as per the erstwhile-LAA of 1894 had become the subject of much criticism across India. To overcome such challenges and widespread resentment, the Ministry of Rural Development repealed this British era Act of 1894 and replaced it with the RFCTLARR, 2013. The BDA hence, had to relook at their compensation strategy in this new light, following which in April 2015; a Resettlement Action Plan (RAP) for the PRR was proposed which offered an enhanced compensation package. This included market rate compensation, TDR, rehabilitation and resettlement benefits, developed land as compensation etc.

The total cost of acquisition which includes compensation and rehabilitation benefits now amounts to Rs 8,100 crore, while the former cost under the previous 1894 Act was Rs 1,930 crore[8]. The BDA had also tied up with JICA to provide project implementation assistance via a loan which amounted to an additional Rs 4,000 crore[9]. The State Government and the Central Road Ministry too, have made commitments to partially fund the land acquisition cost for the project. The BDA however has stated its inability to pay out this higher compensation amount and the PRR remains unimplemented after a decade of its conceptualisation.

3.2.4 Perception of the Project Affected People

A Resettlement Action Plan (RAP), completed in 2015, surveyed the affected area and drew up a profile of the PAPs which is summarised in Table 3 below.

The RAP indicates that the key issues of the project affected people included fears that land beyond the scope of the road was being acquired, they demanded further information on Transferable Development Rights (TDR), and expressed dissatisfaction over the fact that they were unable to either transact or build on their own land for over 10 years delaying marriages of their children etc. Their demands included additional compensation for delay of the project, unwillingness to pay toll once the road was built, jobs for small farmers who lose their livelihood and market rate compensations for their land.

Table 3. Profile of the Project Affected People (PAPs)[5].

1	Number of villages affected	47
2	Number of households affected	647
3	Total PAPs	3995
4	Proportion (%) of PAPs in the productive working age group (16-50 years)	62
4.1	Proportion (%) of PAPs in the 16-30 years age group	35
4.2	Proportion (%) of PAPs in the 31-50 years age group	27
5	Literacy rate (%) among the PAPs	84
6.1	Proportion (%) of PAPs engaged in agriculture	60
6.2	Proportion (%) of PAPs employed in the private sector	12
6.3	Proportion (%) of self-employedPAPs	7

The RAP suggests that the understanding about the project was very low amongst affected people. 68% of the affected households were not even aware of the construction of the PRR. 64% of people preferred cash compensation for their lands at market rates while 30% preferred to opt for a BDA developed house-site at a 40:60 ratio. They had a limited understanding of the benefits of the road to the city, but importantly 91% of the people responded that they either could not say or do not know where to go as a choice of relocation. 13% said that they would like to construct a house with the cash compensation received.

3.2.5 Partial Thrust Towards an Area Development Approach

More recent development in 2016 have seen decisions taken to acquire the land for a total width of 100 m, out of which 25 m would be used for commercial us with increased development rights. This 25 m width commercial zone would serve as two-thirds of the compensation package for land losers and the remaining one-third would be paid as cash compensation[10]. Karnataka State Government proceedings and circulars of May 2016 indicate a partial move towards an area development approach with a 1 km impact area being declared on either side of the PRR where mixed uses and higher FAR will be allowed. The mixed uses and additional FAR (up to 1.25) is expected to influence the landowning farmers/developers to pay up a betterment fee for development of land. Betterment levies, premium FAR and commercial sites auctioning are together expected to bring total revenue of about 10,000 crores. There is no mention however about any other area development measures that will be taken up such as the provision of feeder road networks, connectivity to the PRR, water supply, sewerage, education and health facilities, open spaces etc. that would encourage landowners to pay up these betterment levies.

4 Assessment of the Current Approach to Building the PRR

4.1 No Lessons Learnt from the ORR Experience: Incomplete Road Network and Hierarchy

The rapid ribbon development along the ORR and beyond has led to increased traffic at all major intersections and midblock sections, and this was the mainjustification for the requirement of an additional ring, i.e. the PRR[15]. A closer look spatially at stretches along the ORR (Figure 6) reveals a very low density of road networks connecting up to it as compared to any well-developed and planned area within the city which has a dense interconnected networks of streets, whether or not a clear hierarchy is present.

The ORR (especially the eastern arc) became the preferred destination for IT companies that took up large parcels of land along it. However, land parcels beyond this first layer of plots abutting the ORR have very low connectivity to this major road investment. While this is an underutilisation of a major road investment, it also results in poor traffic management as all vehicles have to travel longer distances and come onto this main arterial due to very few options to take alternate routes or make any left and right turn choices. Pedestrian movement also becomes extremely challenging due to unwalkable block sizes and the impenetrable first layer of plots.

Bengaluru's large portfolio of IT and ITES business houses, located along the ORR have formed an organisation called the Outer Ring Road Companies Association (ORRCA); however one of their largest concerns today, quite predictably, is traffic congestion.

The Indian Road Congress (IRC) in its standards for Urban Roads for example gives a clear classification of roads which are 'Arterial, Sub Arterial, Collector and Local Streets'. The PRR as per this classification would be considered as an arterial as its primary function would be 'through traffic usually on a continuous route'. The other hierarchies are largely missing around the ORR, thereby not allowing any 'lower level of traffic mobility for collection and distribution purposes', and 'entrances to business and residences'. The PRR, if implemented through the same approach, is also expected to suffer the same consequences.

4.2 Land Parcels Around the PRR will Remain Unplanned and Unserviced

Envisioned as a 'direct corridor passage' that does not complete missing road networks or set a road hierarchy in place, results in land parcels of the area not being transitioned in a planned manner from a rural to an urban purpose. Village revenue parcels are often oddly shaped for urban use and need to be brought into a more regular or rectangular shape to allow for internal road connectivity and infrastructure and amenity provision.

4.3 Market Dominated Area Development and Speculation Expected

With no clear plan in place for the area, intermediaries and private developers will tend to capture all the land value increase benefits. Demand for land along the PRR is set to escalate when a large infrastructure project like the PRR is identified and constructed. As in the case of the ORR, there is a growing preference for households and IT firms to shift to the suburbs for large housing and campus style developments[11]. Large isolated gated communities are common features in the city's peripheries which cordon off large parcels of land through negotiated purchase from owners and become islands of excellence that do not contribute to the public realm. While the actual land requirement for the project itself may not always be significant, demand for land in the surrounding areas goes up sharply because of purchases by land speculators[12].

4.4 Non Participation of Land Owners in Projects Decisions and Future of the Area

As land owners are typically only served legal notices for land acquisition, it is evident from the RAP surveys that

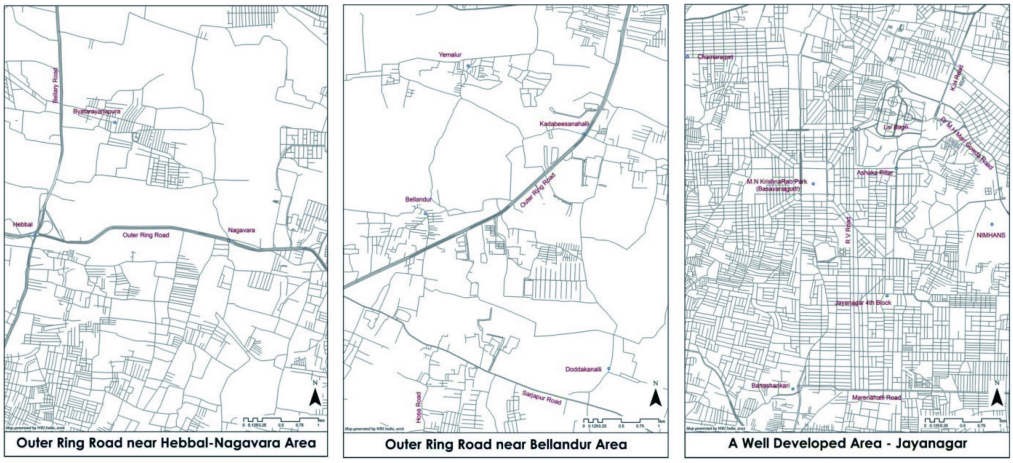

Figure 6. Road density and block size comparison of ORR and a well-developed area in Bengaluru.
Source – Generated by WRI India, Data Source: Open Streets Maps 2016

68% of the affected households were not even aware of the construction of the PRR a decade after it was announced. 91% of the people were unsure of what would be their choice of relocation. Lack of communication with project affected people continues to be a critical gap with low acceptance levels and resistance to the project with many pursuing their legal options against the acquisition.

4.5 Post-development Benefits do not Accrue to Land Owners, Increasing Dissent

Landowners who sell their land for such road projects receive a one-time compensation which is currently estimated on the basis of the market value that is prevalent prior to development. Once a large infrastructure investment such as the PRR is implemented, the value of the land is expected to greatly escalate though the original owners will not receive any of the benefits. Speculators and fortunate landowners who still have parcels abutting the proposed ring road make a disproportionately better financial gain out of such projects.

4.6 TDR as a misplaced Incentive along the PRR

29 wards within Bengaluru city are witnessing declining population growth rates between census years 2001 and 2011. These are areas in the city centre that have the highest levels of municipal services and public transport access including metro rail and buses. With an FAR of 1.75 typically being consumed on an average here, artificially lowering this to 1 FAR, in the hope of make TDR a tradable commodity is counterproductive. The city has no real geographical constraints to growth and the urban spatial footprint of the city is growing at the rate of 594 ft^2 per minute within the BDA jurisdiction. 78% of the PRR alignment today runs through agriculture land. Hence, the only real effect would be that the city centre will be disincentivised from redevelopment instead of being encouraged to increase the affordability and supply of building stock. Doubling of FAR (upto FAR 2 along the PRR) is counterproductive and will cause an unsustainable 'donut' effect where the city centre empties out and 'unserviced' peripheries become the destinations for housing and jobs. TDRs should be awarded in areas where normal FARs could be exceeded such as dynamic growth nodes. Sending and receiving zones are also critical while awarding TDR.

5 Reimagining the PRR through Alternative Approaches to Access and Plan Land

Challenges in land acquisition are not new in India and as many as 414 highway projects are embroiled in equity crunch, and land acquisition hurdles[13]. The Union Minister for Road Transport, Highways and Shipping in 2015, stated that delayed land acquisition and environmental clearances have stalled more than 270 projects across the country[14]. It is observed that such large scale projects aimed at leveraging the potential of cities as growth engines in developing countries throws up multiple challenges such as displacing local population and livelihoods, fuelling land speculations, reorienting employment patterns and increasing environmental health risks[15].

The older 1894 Land Acquisition Act faced opposition from the land owners on grounds of inequity and inadequate compensation; the newer 2013 Act however, faced opposition from urban agencies and investors for being prohibitive in terms of the cost of acquisition, having cumbersome procedures and a long delivery time. The Vice Chairman of NitiAayogin a presentation in Novem-

ber 2014 for example, stated that land acquisition under the new law would take a minimum of five years without even considering the typical delays, protests and court challenges; and that the monetary compensation as per the new act was higher than almost anywhere else in the world.

States and cities all over India are faced with limited financial capacities and sky rocketing land values, but many are able to implement large scale urban projects such as special investment regions, greenfield capital cities, city ring roads and public amenities. They are able to do so using alternative mechanisms to access land which does not necessarily use the compulsory land acquisition method. These alternative mechanisms employ methods of land readjustment, land pooling, leveraging resources of the private sector, land value capture and non-monetary compensation such as the grant of development rights, built up area and other incentives. This is possible because land acquisition and requisition is identified in the Constitution of India as a 'Concurrent List' subject. Hence both the Centre and the States have the power to legislate on the subject, with a condition that the State cannot bring out a legislation which is inconsistent with the Central legislation.

Ahmedabad in Gujarat for example successfully completed its ring road (76 km length) in record time using the Town Planning Scheme (a method of land readjustment) and Surat also has managed a similar feat. The Dholera Special Investment Region (DSIR) in Gujarat for instance is a greenfield industrial city planned and located approximately 100 km south of Ahmedabad. Out of the 920 km^2 of the DSIR, the total developable area is about 580 km^2 which is being developed through six Town Planning (TP) Schemes[16]. The greenfield capital of Andhra Pradesh, Amravati, used a method of land pooling to access 133.55 km^2 of land, again in record time. Not to be left behind the private sector partnered with the State Government of Haryana to implement large developments through a Joint Development model. While the above are mechanisms for green field situations, in Maharashtra, the land locked city of Mumbai has been innovating since the 1990s in redevelopment and amenity provision using the mechanism of Cluster Redevelopment Schemes.

Karnataka State however has not experimented with alternative mechanisms of accessing land and has largely relied on compulsory acquisition of land using eminent domain powers. This is another reason that an area development approach has been lacking in Bengaluru as it continues to lack any legislation related to local area planning. As the PRR has large stretches of greenfield agricultural land, and some stretches of developed and built upon land, four mechanisms used in India which could prove directly useful to access land in both these conditions and provide a planned area development are summarised as follows: The TP Scheme Mechanism (Gujarat); The Land Pooling Scheme (Andhra Pradesh); The Joint Development Model (Haryana) and The Cluster Redevelopment Scheme (Maharashtra).

5.1 The Town Planning Scheme Mechanism (Gujarat)

Planning and Area Development: The Town Planning Scheme (TPS) was originally introduced through the Bombay Town Planning Act of 1915, and is the first known State led alternative to access land for public purposes in India. It is extensively used in Gujarat and to a lesser extent in Andhra Pradesh, Maharashtra and Kerala. It is a micro level plan that follows the land readjustment and pooling method and is typically guided by a Development Plan (DP) prepared as per the provisions of Gujarat Town Planning and Urban Development (GTPUD) Act 1976. This 'partners in development' model brings together a group of land owners who pool their land/plots for development. The GTPUD Act allows up to 35% of land to be taken for roads, social amenities and housing accommodation for socially and economically backward classes[17]. The Act further allows 15% of the land to be kept by the authority for sale for residential, commercial or industrial use, and the remaining land is returned as reconstituted final plots to the landowners. TPS, being an area development scheme enables holistic development of the area earmarked in the Development Plan. Road networks, which range from the main arterials to the collector and feeder road at neighbourhood level get implemented through the scheme. Plots for amenities such as schools, dispensaries, parks and recreational spaces as designated in the scheme is implemented in the process.

Box 1: Implementation of Sardar Patel Ring Road in Ahmedabad, using T P Schemes

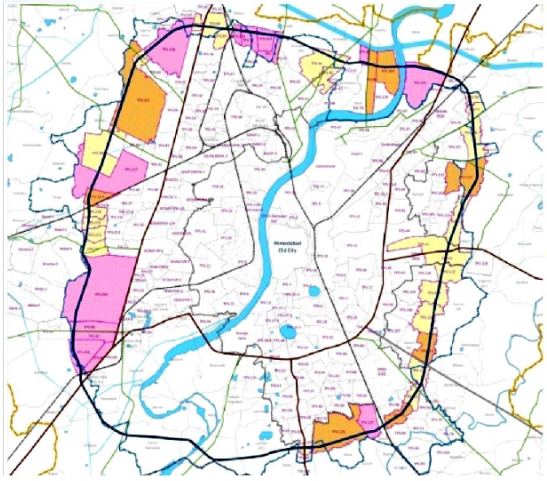

Figure 7. Sardar Patel Ring Road, Ahmedabad[37].

Highlights:

- Sardar Patel Ring Road is 76 km long and 60 m wide. The 47 TP Schemes proposed along this alignment took approximately 4 years to implement.
- Work completed between 2002 and 2006.
- Project cost: Rs 230 crore.
- Approximately a 1 km wide belt along the ring road was reorganised to create the road.
- More than 60% of land was returned to owners close to or overlapping with their original plots. Land owners also reap benefits of appreciation in land value as a result of the ring road and the use of TPS.
- Minimal development rights provided in the zoning codes as predominantly rural at the time in late 1990s.
- The then Municipal Commissioner of Ahmedabad Urban Development Authority (AUDA), Surendra Patel chose not to acquire land using the conventional approach under eminent domain, and opted instead to use Town Planning Scheme in which the owners voluntarily surrendered up to forty per cent of their property in the expectation that improvements made by the authorities would increase the price of his truncated property.

Most of the land owning farmers agreed to the scheme, after being explained the benefits. While substantial amount of the land in the area has changed hands after the implementation of the TPS, many original owners have retained their lands. Additionally, the original owners were able to reap the benefits of the land value appreciation that happened as a result of the Ring Road construction as well as implementation of the TPS.

Source: Box in [35]

Box 2: Proposed T P Schemes to be taken up in Bengaluru

In Bengaluru two projects, namely the STRR and the Bidadi Township (proposed township to the south-west of Bengaluru), have received a push towards development after nearly a decade through the use of T P Scheme. An article in the Hindu states that amendments would be made in the enabling law (Karnataka Town and Country Planning Act, 1961) to reduce the time framework of the T P Scheme legislation as well as issue a monthly pension to the contributing landowners. Land owners unwilling to participate in the TPS would be paid cash compensation. The cash compensation package will be calculated based on the extent and value of land taken over for the project (18). In the Bidadi Scheme, the State will hand over developed land, which includes 836 m^2 of residential plots and about 167 to 250 m^2 of commercial plots per 4,000 m^2 within a 5 km radius of the township to those giving lands for the project. In addition, they will be given annuity while the landless families will be given pension for ten years. In the STRR Scheme, the Authority will take up land pooling and develop the stretch up to 1 km on both sides of the proposed STRR. Of this, it will return 60% of the developed land to landowners and use 30% to develop roads and social infrastructure. The remaining 10% will be sold at market price to develop the road. The timeframe expected to plan and execute the STRR is 3 to 5 years [19].

Financing: Financing strategy for TPS is built on the principle that the benefits of urban infrastructure investments are capitalized through land value capture. Cost of the scheme is partially or wholly financed through the contributions levied by the authority on the landowners for the infrastructure provisions and through the sale or mortgaging of plots obtained through the scheme by the authority. During the draft scheme stage, along with the tabulation of ownership details and plot details, increments in the land value is calculated taking into account the locational advantage as well as disadvantages of the plot. This increment in land value is a result of government intervention through providing infrastructure facilities and hence the landowners are entitled to pay a percentage of the increment as betterment levy. Betterment levy is calculated as the difference between 50% of the increment in land value and the compensation to be paid by the authority for land appropriated.

Advantages and Disadvantages: TP scheme is a win-win proposition for both the government and the landowner, as both the government and landowners share the post development benefits. The government authority executing the scheme, strives to ensure that owners receive reconstituted plots at the original location itself. While TP scheme is known for its robust and comprehensive approach to development, in some cases it has faced administrative and procedural delays that hamper the timely implementation of the scheme [20]. With powers vested in the State government to approve and sanction the stages of TPS, the process has become fairly centralised and time consuming. The non-inclusion of the landless PAPs, who may be dependent on the land taken up for the scheme for their livelihood is also a drawback of the TP scheme.

5.2 The Land Pooling Scheme (Amravati)

Planning and Area Development: The Land Pooling Scheme (LPS) was introduced for the development of the capital city Amravati through the Andhra Pradesh Land Pooling Scheme Rules, 2015. Several States such as Punjab, Haryana and the Magarpatta township of Maharashtra and most recently Delhi have explored land pooling schemes for accessing land for developmental works. It is typically a master plan guided process, wherein areas for public purpose reservations are delineated. In this mechanism, land parcels owned by individuals or a group of owners are legally consolidated by transfer of ownership rights to the Authority, which later transfers the ownership of a part of the land back to the original land owners. Landowners voluntarily surrendering land for the scheme, get reconstituted developed land based on the type of land and its ownership status. For instance for every acre of land surrendered by landowners possessing a patta, they in return get 25% of land in case of dry land and 27% in case of wet land. Whereas in case of assigned land, the landowner get 19% of land in case of dry land and 21% in case of wet land. Regular shaped plots with infrastructure services are ensured to the landowners through the LP Scheme. Sector level roads, internal road networks, infrastructure/services (including water supply lines, power supply, rain water harvesting, sewage treatment facilities, water treatment facilities, etc. falling in the share of the land guaranteed to the land owners are developed through LPS [21].

Financing: Similar to the TPS, the cost of developing infrastructure facilities, amenities and trunk infrastructure incurred in the LP scheme is to be recovered by using the land which will be retained by the authority. The Andhra Pradesh Capital Region Development Authority Act, 2014 under the provisions of which the LPS scheme is prepared permits developer entities to undertake LPS, in which case the cost of the scheme would be borne by the developer entity. LPS of Amravati has factored in skill development programmes and monetary benefits for the landless families such as one time agriculture loan waver and interest free loans to poor families for self-employment. A capital region social security fund is created to provide pensions of 2,500 rupees per month per family for a period of ten years to all landless families [21]. For the maintenance of the common infrastructure and services such as roads, street lighting, solid waste management, sewerage treatment facility, water supply, parks and play grounds and other amenities, the reconstituted plot/landowners are charged with usage, consumption and maintenance charges.

Advantages and Disadvantages: In addition to offering developed land, monetary benefits in the form of annuity payments are paid out to the land losing farmers. It fares better than the TP scheme in aspects such as rehabilitation strategies for the landless project affected families and it also seeks the consent from interested parties or landowners to participate in the scheme. While the LP scheme has a simpler process that is described systematically in the Act, the grievance redressal mechanisms are vaguely described. There is a no restriction imposed on the type of land to be taken for LP scheme, and fertile agriculture land has been assembled for the capital city development in Amravati.

5.3 The Joint Development Model (Haryana)

Planning and Area Development: The Haryana Development and Regulation of Urban Areas (HDRUA) Act, 1975, legally permitted private participation in the supply of serviced urban land by designating certain planned areas for private land assembly. While this mechanism is commonly termed as Joint Development Model of Haryana, variations of public private partnership models of land assembly are used in Uttar Pradesh, Gujarat and Tamil Nadu. In the Joint Development Model, private developers acquire and assemble land through market price negotiations from landowners and then apply for a licence to develop the land into residential, commercial or industrial colonies in conformity with the land use plan. The mechanism ensures that adequate educational, health, recreational and cultural amenities as per the norms and standards provided in the development plan of the area is provided by the owner/private developer. Additionally the private developer has to reserve land for roads, open spaces and such common facilities, which varies from a minimum of 20% of the gross land area, in case of low density eco-friendly colony to 45% in case of plotted or group housing colony development [22]. In the process, the infrastructure amenities for the colonies are built by the private developers, who make profitable gains through sale of plots in the open market. The external trunk infrastructure amenities are to be provided by the government authorities.

Financing: The developer deposits infrastructure development charges, which are to be used for stimulating socio-economic growth and the development of major infrastructure projects in Haryana. The HDRUA Act stipulates that the private developer, making a net profit (through sale and lease of plots or built up area in open market) above 15% after the completion of the project period, has to deposit the surplus amount in the State government treasury or spend this money for further facilities. The private developer makes profit through sale of plots/flats in the open market. Being a land development model, the supporting legislation does not have any provision for arriving at the land value and compensation offered to the original owners of the land. Cost of developing the internal infrastructure in the colonies will be borne by the

private developer. Trunk infrastructure facilities which are to be developed by the government authority are partially funded through the external development charges which the developer has to pay.

To ensure affordable housing, the colonizer has to sell 25% of plot in case of plotted colony development on a no profit no loss basis at a price determined by the director of the authority. Secondly, the colonizer has to reserve 15% of the total developed residential plots/proposed to be development for allotment to economically weaker sections (EWS) in case of development of a group housing and 20% in case of plotted colony development. Around 8,000 plots for EWS were developed in Gurgaon using this model [23]. In order to ensure the upkeep and maintenance of the group housing colony, for a period of 5 years from the period of completion, the authority keeps 1/5th of the bank guarantee amount unreleased. The act states that the colonizer has to deposit 30% of the amount collected from the plot-holders within a period of 10 days of its realisation in a separate account which will be released only on satisfactory completion of internal infrastructure amenities.

Advantages & Disadvantages: In Joint Development Model, by engaging the resources of private developers in urban development, the financial burden of developing infrastructure amenities in the layout are transferred from the authority to the private developers. Guided by the profit motives, private developers built layouts with infrastructure amenities within the stipulated time framework. However with the intention of maximizing profits motives private developers tend to build their colonies at locations only where they could assemble land from the market through negotiations with local landowners [24]. Landowners do not receive any post development benefits. While there are provisions in the Act and rules to ensure the execution of the development works by the private developers, there are no clauses in the Act to ensure the implementation of external development works by the authority.

5.4 The Cluster Redevelopment Scheme (Maharashtra)

Planning and Area Development: The Cluster Redevelopment Scheme (CRS) was introduced for the redevelopment of dilapidated and old buildings in the city through an amendment in the Development Control Regulations in 2009. Clusters for redevelopment are chosen as per the Development Plan or an Urban Renewal Plan. Under this scheme, cluster of buildings that are eligible as per the norms set by Maharashtra Housing and Area Development Authority (MHADA) having a minimum area of 4,000 m^2 are redeveloped and handed over to eligible tenants either by a private developer or a government agency [25]. The promoter or developer of the CRS redevelops cluster of old and dilapidated of buildings that are eligible as per the criteria set by the authority, with the consent of 70% of the tenants as well as the landlord. The promoter of the scheme pools land belonging to various categories of land holders including public land through:

i) Purchase of land belonging to state government or MCGM or MHADA or agency under state government;

ii) Exchange of such land with a suitable land of equivalent value as per land rates in the Annual Statement of Rates (ASR);

iii) Procurement of development rights over such land;

iv) Transfer of all land included in the CRS to a legal entity;

v) Acquisition of land, provided that promoter purchases rights over at least 70% of the land comprised in the URC and there are dangerous buildings on the balance land contained in the CRS.

Through the CRS, redeveloped areas are provided with better housing and public amenities such as open spaces and wider road networks are developed. High power committee appointed for the CRS ensures that the reservations made in the Development Plan get implemented through the scheme. To ensure the development of reservation mandated in the DP, the promoter has to hand over 60% of the zonal FSI under reservation or Built Up Area (BUA) of the amenity to the authority free of cost and free of FSI. The promoter has to hand over BUA equivalent to 30% of zonal FSI, in case of development of reservations of Rehabilitation & Resettlement under URS, free of cost and free of FSI in addition to rehabilitation of existing tenements or users.

Financing: The promoter has to pay development charges which is charged as per the provisions of the Town Planning Act as well as a surcharge which is referred as the infrastructure charge to the Municipal Corporation of Greater Mumbai (MCGM). The promoter gets incentive FSI which is based on the ratio of Cost of land included in the scheme as per ASR and the construction cost in Rs/m^2 applicable in the same area as per ASR [27]. CRS get an FSI of 4 or sum total of the Rehabilitation FSI + Incentive FSI, whichever is more. The incentive FSI that the promoter gets cross subsidises the cost involved in constructing and handing over the rehabilitation tenements free of cost to the eligible tenants. Each eligible tenant get carpet area equivalent to the area occupied by such tenant the old building and also 'additional area' for residential/residential cum commercial tenement based on the size of the URC. Each eligible slum dweller get a carpet area of 25 m^2 in the scheme. The promoter is entitled to create a corpus fund, which is a minimum of 50,000 per tenement or as directed by the High Power Committee (HPC), which is used for the mainentenance of the rehabilitation buildings for a period of 10 years.

Advantages & Disadvantages: The scheme facilitates rehabilitation of eligible tenants in better housing facili-

ties as well as development of public amenities such as open spaces and wider road networks on land which otherwise remain non-accessible for public purposes. The mechanism ensures that consent is obtained prior to proceeding with CRS and also mandates a feasibility study to assess its impacts in advance. Mechanisms to prevent malpractices while obtaining the consent are not clear, as there is a possibility that the consent might be obtained through coercion. Though the scheme requires consent of the tenants prior to the initiation of the process, there is no scope for tenants to participate in the planning and implementation of the scheme.

6 Lessons for the PRR from the use of Alternative Mechanisms to Access Land

Different Indian cities have, with an aim to provide seamless traffic movement and prevent through traffic from entering the core city, constructed ring roads with varied degrees of success. One of the most successful examples as discussed was using of the T P Scheme in Ahmedabad as it not only resulted in road development but also area development and was completed in just 4 years[28]. Surat also similarly completed its ring road and is using T P Schemes for area development. However, cities that opted for Land Acquisition to implement ring roads have faced cost and time escalations, often remaining incomplete till date. Hyderabad embarked on a ring road of length 158 km in 2006 (Bengaluruis said to have been modelled on this) and required about 24.5 km^2 of land[29]. The road is being built in phases at a cost of about Rs 6,696 crore since 2007 and is expected to reach completion by 2017. The Hyderabad Growth Corridor Ltd (HGCL), a special purpose vehicle formed to build the road has faced cost overruns to an extent of 15% to 20%. JICA is providing phased funding of Rs 3,558 crore for a stretch of 71.30 km[29]. Jaipur similarly opted for compulsory land acquisition for its 125 km ring road using the erstwhile LAA 1894 through a PPP model and has only completed land acquisition of the southern arc of its ring road[30].

Key lessons for the PRR include:

6.1 Utilise Various Alternative Mechanisms in the form of a Hybrid Model

A reassessment of the project needs to be undertaken to understand the current status of land acquisition (including government land) to see how much land is yet to be acquired. This yet to be acquired land could be categorised into fully developed, semi developed and agricultural lands and the choice of appropriate alternative mechanism could be applied. Land pooling and readjustment models (like the TPS) could be utilised in the agricultural land stretches of the road alignment. Difficult stretches could be accessed using the resources of the private sector using the JDM model allowing market price negotiations between the landowner and the private developer with pre-determined incentives that the government will provide. Lastly, the CRS approach could be explored for densely built up areas (residential, commercial and mixed use areas) ensuring rehabilitation and reconstruction of homes and businesses that have been set up. The project could be phased accordingly. However, while considering these mechanisms, it is important to contextualise these mechanisms taking into account the local conditions, the development objectives and shortcomings of the current land delivery system. For instance, consensus building to ensure participatory land development process could be incorporated into the alternative mechanism chosen to minimise the opposition from the landowning farmers.

6.2 Master Plan to Incorporate Area Development Approach

Bengaluru's City Master Plan is currently under revision and is a legally enabled process by which the resulting plan is a statutory one which has to be followed by all. While the courts have given a go ahead for land acquisition for the 100 m right of way of the PRR itself, it does not permit further acquisition related to the project unless and until the PRR is implemented. This is where the full potential of a master plan can be realised where strategies of land readjustment and land pooling such as the T P Scheme or the Land Pooling Scheme could be utilised to ensure planned and serviced land as a Phase 2 of the PRR. Local area planning could also be introduced as a micro level plan to the macro level master plan to enable area development. This will also give the BDA ample opportunities to factor in cost recovery mechanisms.

6.3 A Dynamic Leader and Efficient Project Management are Key to Drive Project Success

The presence of a visible and dynamic official will play a pivotal role in the execution of the project determining the success and timely completion of such projects. This has been seen in the Ahmedabad Ring Road project as well as in Amravati Capital City Development. A credible face explaining the projects benefits, convincing people, and thereby winning their confidence and trust is imperative. Backing such a leader should be a robust project management and delivery team that assesses risks, factors in operation and maintenance costs and chooses appropriate delivery mechanisms based on a wide array of issues such as regulatory status, land owner priorities and degree of risk.

6.4 Land Value Capture for Land Owners and Government Agency Alike

The unearned increment resulting from the rise in land values and change in use of land from public investment or decisions or due to the general growth of the community must be subject to appropriate recapture by public agencies[31]. Land readjustment and pooling ensure that post development benefits such as land value increments and the developed land with services are shared between the government agencies as well as with the landowners. While government agencies get land for the envisaged development free of cost, the landowners benefit from the rise in value of the land they possess. This approach to accessing land is less prone to resentment from the landowners, as they are not left out in the process of land development. JDM uses infrastructure development charges for service delivery, which gets transferred to the end user. CRS leverages the built up land for a social cause (that is affordable housing for EWS) as a tool for capturing the benefits of redevelopment. The land based fiscal tools have to be essentially seen as benefit tax used for financing capital investment (or also to service debt when required), but certainly not for general administrative or O & M expenditure[32].

6.5 Project Legacy: Planned, Financed and Serviced Urban Expansion

The legacy of the ORR should serve as a reminder that the PRR must not take the same route. While BDA managed to develop a few layouts with fair connectivity to the ORR, it was not to scale and most sections today have poor access. The PRR should have broader benefits that percolate beyond the linear corridor through creating planned developments with interlinked street networks. Area development schemes such as LPS, TPS and JDM ensure that planned developments happen in the urban periphery. CRS does the same in an already built upon context. These areas benefit through planned services such as road networks, water supply, sewerage and electricity as well as social and recreational amenities. Private developments in the urban expansion areas are to be regulated through such area development schemes that are guided by a macro level development plan.

6.6 Getting Land Owners, Government Agencies and the Private Sector on a Single Platform

Government coffers do not get strained to build the road or develop the area, when they opt for alternative mechanisms to access land. The burden of upfront payment of cash compensation as in compulsory acquisition is eliminated. In addition to this benefit, government agencies have options to use land as a fiscal tool to finance further infrastructure developments.

From the point of view of land owners, the leading causes for resentment typically includes displacement, insufficient compensation, urgency clauses misappropriated, absence of a space for communication between the impacted community and the project implementers for transparent negotiations, and the absence of a choice in moving into a transformed common future associated with the process leading to their displacement[33]. Mechanisms such as TPS, LPS and CRS ensure that many of the above concerns are addressed. Provisions for landless labourers will need to be an additional factor to be addressed as some of these State led mechanisms do not have provisions for the same. The impact of land acquisition on the landless farmers could be reduced, if a percentage of land acquired is reserved for affordable housing and auctioned at subsided prices to eligible landless project affected families.

Private developers too who are large players in the land market have ample opportunity to engage with government agencies using models such as JDM and CRS. The government too needs to hone its skills in engaging in public private partnerships in a structured and defined manner to not only leverage the resources of the private sector but to also prevent any unethical practices or information asymmetry.

7 Way Forward – Reaching the Elusive Middle Ground Between all Stakeholders

Infrastructure has emerged as a dominant source of demand for land, and it is widely believed that the growth momentum of the Indian economy in recent years cannot be sustained unless infrastructure bottlenecks are swiftly and adequately removed[12]. While considering mega scale projects, more efforts need to be put into the early phases of planning which include a broad, open reconnaissance stage where various potential solutions for the road development are studied and discussed together with the local stakeholders[32].

After over a decade of facing implementation hurdles, the PRR needs to realistically assess the current ground conditions and employ multiple solutions to promote holistic development of the PRR influence area as well. Lessons from the ORR experience too should serve as a guidance to not repeat old mistakes of conceiving it as a mere strip of road on ground. The phase I of the PRR, which involves just the construction of the road (75 m ROW + 25 m commercial development) will continue to face challenges as levying betterment charges without area development will be difficult. However phase II of

PRR needs to be reimagined as a catalyst to plan and finance serviced urban expansion. By employing an area development approach in the impact area of PRR in the phase II, spatial development could be integrated with transport development increasing efficiency and accessibility of movement to a better planned and sustainable city form.

Land value capture is an opportunity not to be missed by government agencies as there is only limited revenue that can be recovered from development charges and change of land use fees post project implementation. Private developers and market forces should be managed and embraced through structured partnerships especially in situations where the govern-ment coffers are heavily strained. Participation and buy in of the people is a critical way forward if any large projects have to be moved forward and such affected persons must benefit from post development gains.

Karnataka State and hence Bengaluru City has traditionally relied on using the compulsory land acquisition method as enabled by the National Land Acquisition Act (1894 and more recently the 2013 Act) via the Karnataka Town and Country Planning Act (KTCP), 1961. An important piece of legislation that is lying dormant within the KTCP Act is the Town Planning Schemes legislation which has never been used in Bengaluru since independence. It is heartening to note that agencies such as the Bangalore Metropolitan Region Development Authority (BMRDA) are exploring the idea of alternative mechanism such as TPS and LPS for the STRR and the Bidadi Township. The Directorate of Town and Country Planning (DTCP) too has in the recent past taken up measures to amend the TPS legislation to make it more applicable for current day needs. While challenges abound such as the BDA being unable to charge a toll on the road as per its Act, and having limited experience in leveraging private sector partnerships, it is time to do a rethink on the future of infrastructure projects for the city and to find viable alternate solutions.

Rather than displacing many and benefitting a few, projects like the PRR should have a long term comprehensive vision of road and area development because it will have a lock in period of over a hundred years. The lessons learnt from the use of alternative mechanisms to access land would go a long way in reaching that middle ground between land owners, government agencies and the private sector. The legacy of the PRR should move beyond requiring another ring road to decongest traffic within 5 years of when it gets implemented.

As a next step to this practice note, the authors are undertaking an on ground exercise to assess the financial feasibility of using alternate mechanisms to access and plan land. This will assess existing land values in the area, post project implementation escalation in land value, area development charges and on ground complexities and cost recovery options with respect to public or private investment in infrastructure provision etc.

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