

**Digital Broadcasting:  
issues & challenges**



सत्यम् शिवम् सुन्दरम्

**SUNIL**

**Additional Director**

**General**

**DD India**

**[sunil.ddi@gmail.com](mailto:sunil.ddi@gmail.com)**



# CONTENTS



सत्यम् शिवम् सुन्दरम्

Evolution of ATV and DTV in India

DD Plans

Motivation for DTT

Issues and Challenges

Measures to promote DTT

Conclusions



# Doordarshan India: Annals of 56 Years from Black & White to DTT



Color Television in India started since XI Asian Games held in November 1982 In New Delhi.



15<sup>th</sup> September 1959  
500 W Analog B&W TV  
VHF Transmitter Channel 4  
at Delhi, on air for half an hour, three days a week .

23 Years Later



2003:DVB T at 4 Metro cities  
2007: DVB –H at Delhi



21 Years Later

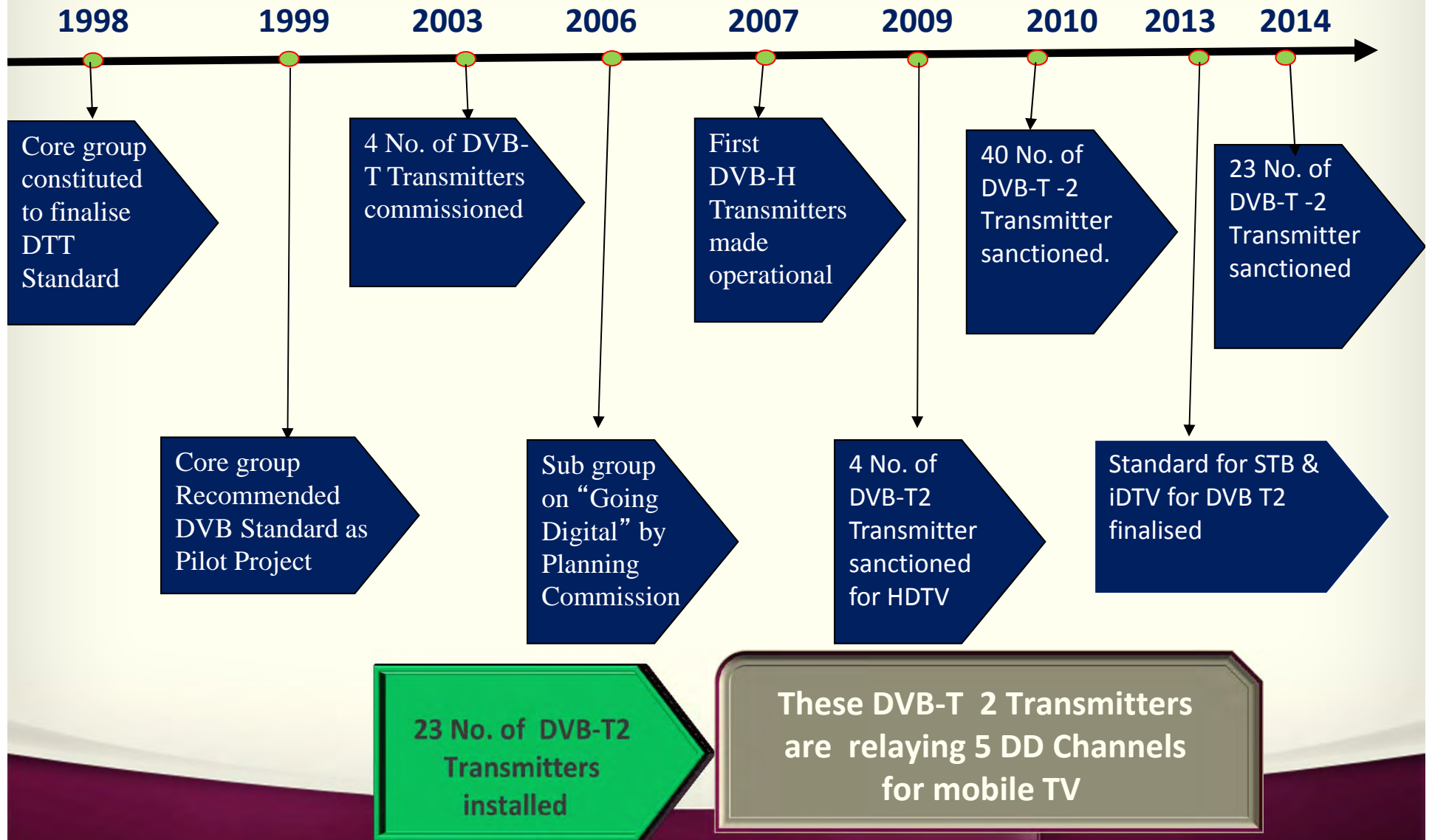


12 Years Later

2015:DVB T2 & T2 –Lite ready at 19 locations



# Journey of Development of DTT in India:





# DTT: World-over Positioning and Potential

- **World Scenario: DVB-T2 has been deployed by 68 Countries and accepted by 28 Countries. More than 150 countries have chosen DVB-T and T2.**
- **DVB-T2 Transmission can be received in Fixed, Portable and mobile devices.**
- **DVB-T2 Chip Manufacturers: Sony Semiconductor, Mstar, Altobeam, Broadcom NIM, Broadcom soC, Panasonic, Silicon Lab. DVB-T2 Diversity chip for In-Car Receivers: Sony SMT-EW 300, Parrot Octopus 3, Siano SMS 4470**
- **Integrated Digital TV(iDTV)(In-built DVB-T2 Tuner) Brands like Samsung, LG, VU, Sony etc. already available in Indian Market.**
- **Dongles and Wi-Fi Dongles for DVB-T2 available for mobiles and tablets. Few embeded DVb-T2 smartphones available.**
- **DVB-T2 Radio Services are popular in many countries like UK(24 National and 9 Regional), Italy(24), Spain(34).**



seeing



listening



driving



walking



# DTT Plans



Scheme	No. of Transmitters
XI Plan HDTV	4 Nos.
XI Plan Digitalization	40 Nos.
XII Plan Digitalization	23 Nos.

## Grand Plan of Digitalization

- **230 DTT HPTs and 400 DTT LPTs for equivalent coverage as in Analog mode. Many number of gap fillers will be required.**



# Innovations-Roads of DTT



सत्यम् शिवम् सुन्दरम्

 Revenue Model

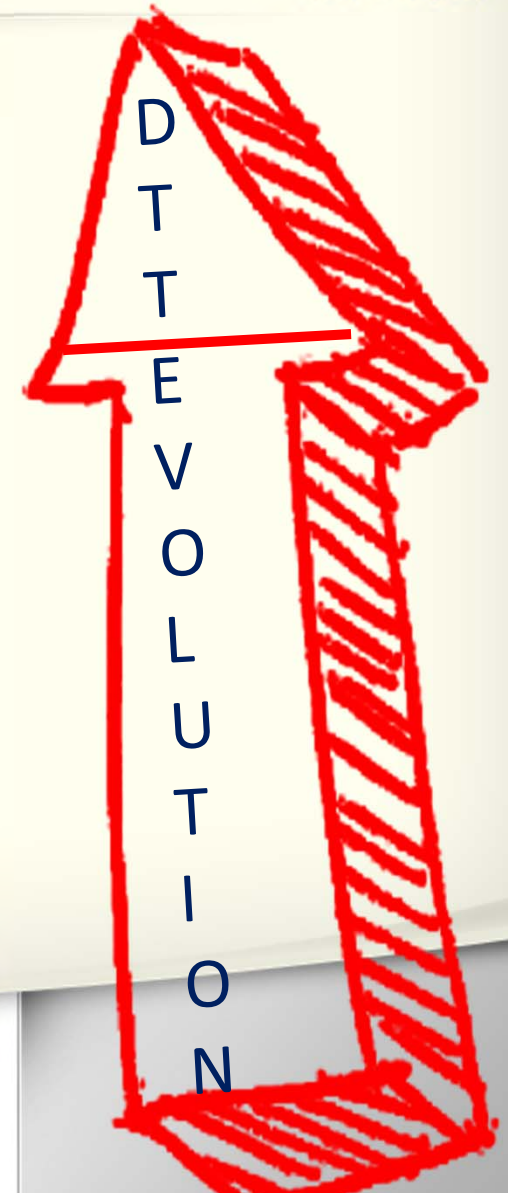
Business Model Innovation

 Programme Services

Content Innovation

 Infrastructure prod.

Technological Innovation



# Motivation for Migration to Digital



**Analogue TV**

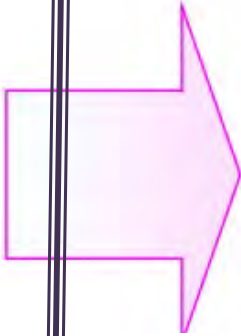
**Multi-channel SDTV**



**Digital TV**



**HDTV/  
UHDTV**



**Mobile TV/  
Radio**

**Ghost and Noise**



**Moving  
Vehicle**

**Excellent picture and  
sound quality**



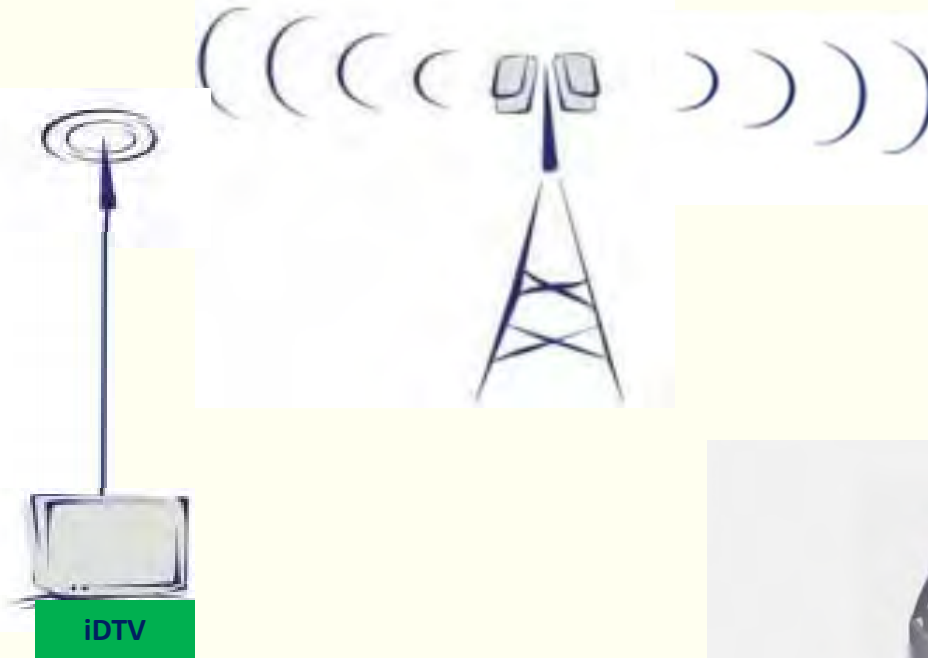
# Options & Challenges for receiving devices



सत्यम् शिवम् सुन्दरम्



Normal TV



iDTV



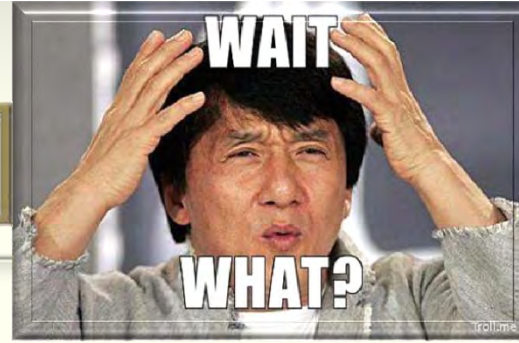
The DVB T2 dongle

Dongle in Smartphone



Moving Vehicle

# Programme Genres



Music Channels



Local Content



RADIO Channels



Sports Channels



Short Drama



News



Information Channel



# Strategic Issues ,Decisions & Plans



- a. Vision : Plan for DTT Expansion & Strategy : Area wise or Nation wise**
- a. Spectrum Planning**
- b. DTT Locations : Site Elevation, Population density in coverage Area, Coverage similar to Analog coverage.**
- c. Tower Strengthening**
- d. Extensive signal survey.**
- e. Commissioning Time: Special sporting event , Election periods, Festival seasons or any event of Regional/National Importance.**
- f. Motivate receiver manufacturers and such areas may be given priority for DTT.**
- g. Content: Select most popular prog channels on DTT. If possible exclusive and appealing content . Genre combination of programmes should be based upon survey feedback.**
- h. Occasional one day analog switch off trials to gain experience and mitigate challenges.**
- i. Analysis viewers reaction and expectations.**
- j. Publicity campaign should be consistent and innovative.**



## Strategic Issues ,Decisions & Plans



कृत्यम् शिष्यम् सुन्दरम्

- a. The contents should be more in quantity and quality. About 20-25 TV channels in Free to Air Mode is desirable
- b. Good receiver eco-system for fixed , portable and mobile should be there.
- c. The black spots should be covered with gap fillers in SFN.
- d. Simulcast should not be longer than 1.5 -2 years.
- e. Transmitter RF Profile like Fec rate, modulation, Guard interval, Pilot Pattern, Symbol Length, FFT etc. should match the receivers of targeted type.
- f. Make mandatory provision of DTT Tuner in TV and smartphones.
- g. Spell out DTT Roll out and analog switch off schedule.
- h. Decide whether to go for fixed or mobile and SDTV or HDTV or UHDTV.
- i. If Govt. funding is limited, issue DTT License to other broadcasters than PSB.

# Some of DVB-T2 Enabled TV

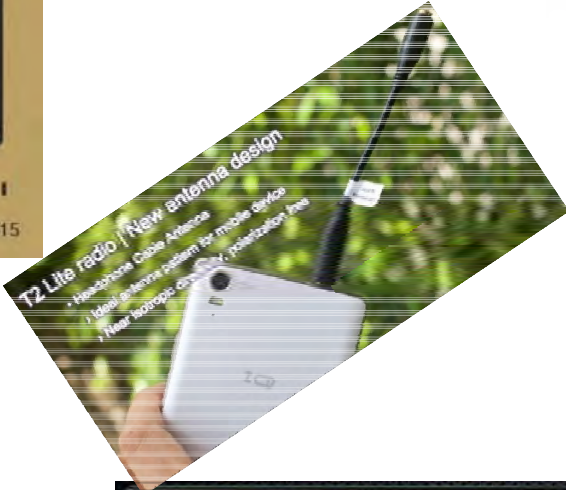
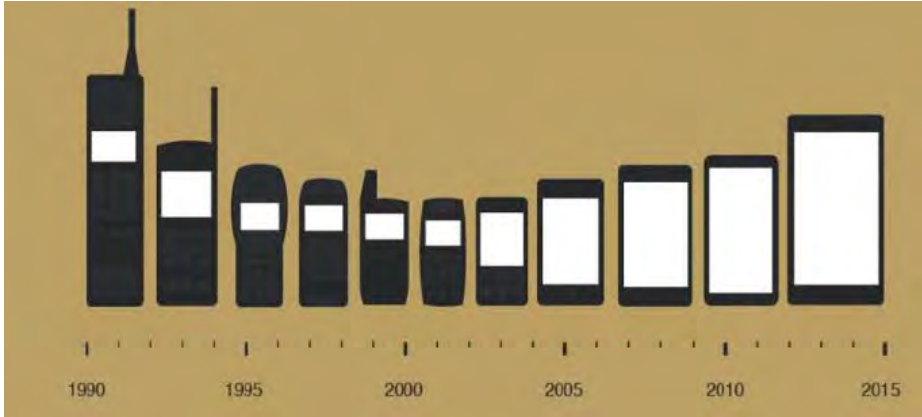


सत्यम् शिवम् सुन्दरम्

Make/Model	Picture	Price	Link
VU / 40K16		Rs. 35,990/- ( <a href="#">flipkart</a> )	<a href="http://www.flipkart.com/search?q=Vu+102cm+%2840%29+Ultra+HD+%284K%29+Smart+LED+TV%284+X+HDMI%2C+3+X+USB%29&amp;otracker=start&amp;as-show=on&amp;as=off">http://www.flipkart.com/search?q=Vu+102cm+%2840%29+Ultra+HD+%284K%29+Smart+LED+TV%284+X+HDMI%2C+3+X+USB%29&amp;otracker=start&amp;as-show=on&amp;as=off</a>
Sony / KDL-42W700B		Rs. 67,900/- ( <a href="#">snapdeal</a> )	<a href="http://www.snapdeal.com/product/sony-kdl42w700b-42-inches-bravia/500349709">http://www.snapdeal.com/product/sony-kdl42w700b-42-inches-bravia/500349709</a>
LG / 42LF560T		Rs. 44,786/- ( <a href="#">amazon</a> )	<a href="http://www.amazon.in/LG-42LF560T-106cm-inches-Full/dp/B015OF2BSE/ref=sr_1_1?s=electronics&amp;ie=UTF8&amp;qid=1463381712&amp;sr=1-1&amp;keywords=LG+%2F+42LF560T">http://www.amazon.in/LG-42LF560T-106cm-inches-Full/dp/B015OF2BSE/ref=sr_1_1?s=electronics&amp;ie=UTF8&amp;qid=1463381712&amp;sr=1-1&amp;keywords=LG+%2F+42LF560T</a>
Samsung / H5570		Rs. 40,455/- ( <a href="#">amazon</a> )	<a href="http://www.amazon.in/s/ref=nb_sb_noss?url=search-alias%3Delectronics&amp;field-keywords=%09Samsung+32J5570+81.28+cm+%2832+inches%29+Full+HD+Flat+Smart+Series+5+TV">http://www.amazon.in/s/ref=nb_sb_noss?url=search-alias%3Delectronics&amp;field-keywords=%09Samsung+32J5570+81.28+cm+%2832+inches%29+Full+HD+Flat+Smart+Series+5+TV</a>



# Device Diversity





# Digital Terrestrial Television system: Boon for Education and during Floods etc.



Large Screen display > 120" on wall.

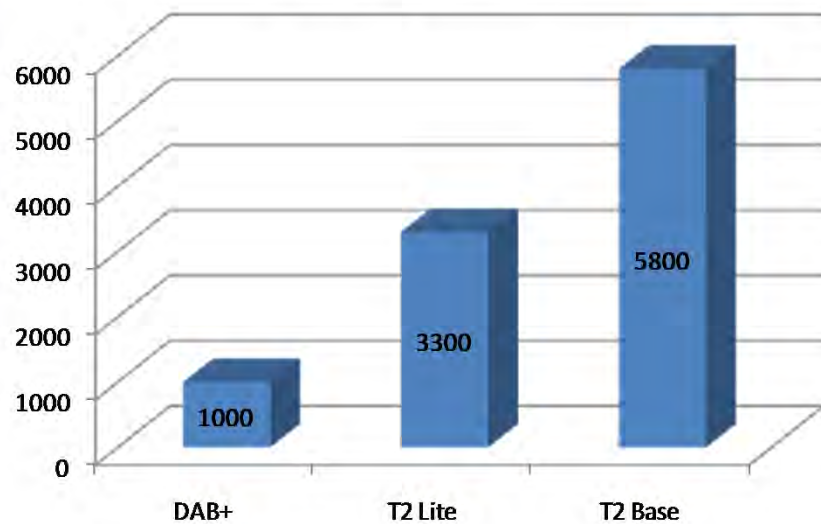


# DVB-T2 Radios

	FM Radio	DRM+	DAB+	T2 Lite
Programme channels	1 programme in HiFi stereo	Approx 2-3 programmes	Approx. 16 programmes	Approx. 48 programmes
Data rate	1.1 kbit/s for RDS	37-186 kbit/s	~ 1056 kbit/s	~ 3300 Kbit/s
Bandwidth	390 kHz (Carson)	96kHz	536kHz	1.7 MHz , 8 MHz

( About 37 Countries relay Radio on DVB-T/T2 Transmitters)

## Capacity in Kbps



### Comparison : DAB+ Vs T2 Lite:

- i. Same Propagation DVB-T2 same propagation model as DAB FFT size = 8K ext , GI 1/16 ,16QAM : 3 times more capacity with DVB-T2 compared to DAB.
- ii. With the same capacity as DAB (13,5 dB) the broadcasting strength with DVB-T2 (~4,1 dB) could be reduces more than 8 times (13,5 - 4,5 dB = 9 dB) with an equivalent reduction of the transmission costs.





# DVB-T2: Options & Challenges



## Signal Expansion

- ✓ To achieve similar coverage analogous to existing analog TV, Many new DVB-T2 Transmitters are required. So DTT Network need to be expanded.
- ✓ For mobile TV many gap fillers in SFN will be required.
- ✓ Underground Metro Train require signal using Radiating(Leaky) Cables.
- ✓ More Funds will be required.
- ✓ For 3-4 Mux Spectrum planning is to be carried out with in UHF band 470-694 MHz.

### Challenges

### Options

- ✓ Some of existing Analog XTRs may be upgraded in DVB-T2 by replacing items like Modulator etc.
- ✓ 1.7 MHz T2 Radio in VHF Band may be useful step.
- ✓ More coverage will expedite receiver development also.
- ✓ PPP Model for expansion is other option.



# DVB-T2: Options & Challenges



सत्यम् शिवम् सुन्दरम्

## Compression Chain

MPEG-4 H.264 AVC

### Option:

**HEVC: H.265 offers about 50% Capacity advantage Over MPEG-4. So more Channels can be accommodated. It is more useful for HDTV and UHD TV**

### Challenge:

**Availability of receivers for HEVC is big challenge. But in near future it may not be a big issue.**

HEVC: H.265

# DVB-T2: Options & Challenges



## Content for DTT

### Option:

Many SDTV or HDTV or Combination there of is feasible.  
Mobile TV and Radio Transmission is also feasible.  
More content provider get opportunity with DTT Platform.  
Emergency alarm messages

### Challenge:

Availability of new content is a big challenge.  
Mobile TV require innovative and appealing content.  
Aggressive publicity and public awareness campaign is essential.

# DVB-T2: Options & Challenges



## Receiver Availability

### Option:

Chip and Devices Manufacturers have good business opportunity for development of iDTV, smartphone with DVB-T2 Tuner and car receivers.

### Challenge:

Regulation for mandatory provision for DVB-T2 Tuner for TV and Smartphone from specific date should be there to promote receiver eco-system. .



# DVB-T2: Options & Challenges

## Business Models

### Option:

FTA or Pay TV.

Govt. funding and Public information, entertainment, education .

Interactive Services

Third Party Integration , E-Shopping.

### Challenge:

Initial push for network of manufacturer, broadcaster, advertisers, auction of carriers, selection of third party integration for various application benefits.



# Market Opportunities with DVB-T2



Mobile TV



Fixed



Moving Car

T2 Radio

Laptop & Tablets



## Analog Switch Off- Digital Switchover

Digital

Analog

- Budgetary support for Network
- Content aggregation
- Financial support may be necessary: subsidizing digital receivers and antennae modifications
- Mandating digital tuner
- Consumer Awareness & Publicity : Call centre, Leaflet, Website, Posters & Hoardings, Talk Shows, Cross Media publicity.





## Conclusions



- **Digital Terrestrial TV should have more values than multichannels; i.e. pure HDTV, datacast, interactive service, mobile reception.**
- **HDTV sets, Car Receivers , Dongles and Mobile with built in –DVB-T2 Tuner are available but more innovations and motivation needed for mobile devices with in-built DVB-T2 Tuner.**
- **Need promotions and incentives.**
- **Contents need to be innovative .**
- **Lease out capacity to other broadcasters. Genre to be decided for other broadcasters.**
- **Regulation for Mandatory provision in new receivers say w.e.f 1.1.2018.**
- **Challenges are there which can be overcome but Options are in plenty .**