

# Operator Experience with EGNOS

EGNOS Annual Workshop 2017



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SWISS Flight Operations Support  
Athens, 03.10.2017

# Content

Introducing SWISS



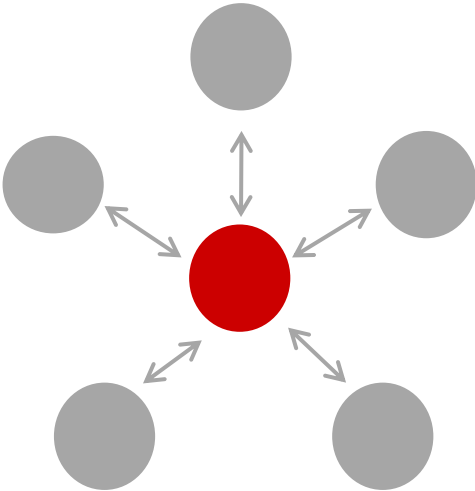
Bombardier C Series



LPV approach (SBAS)



# Introducing SWISS



Hub and spoke network  
carrier with main hub  
Zurich

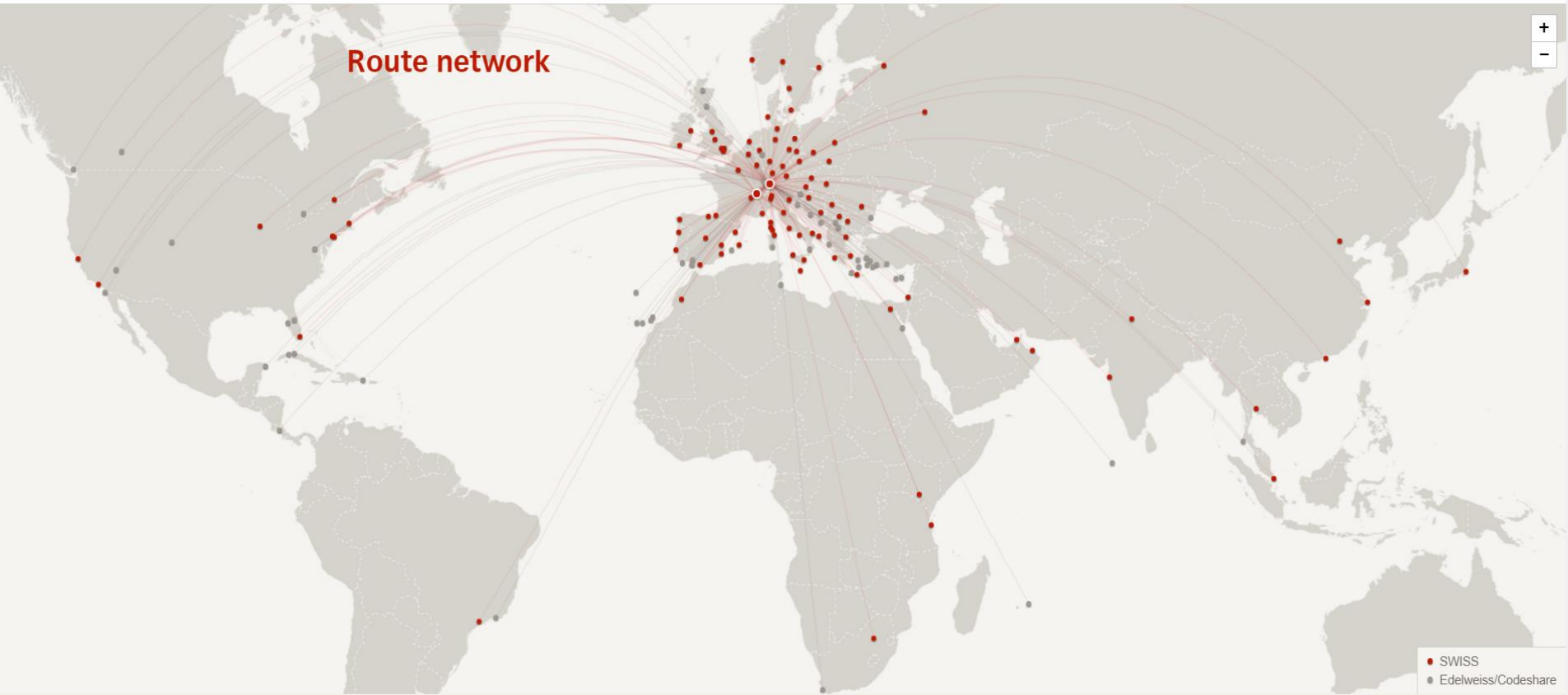
STAR ALLIANCE







**Lufthansa Group**



# Introducing SWISS



# Introducing SWISS

Aircraft Fleet	SBAS	RNP Approach	
		Baro VNAV	LPV
 <b>Bombardier C Series (12)</b>	✓	✓	✓
 <b>Airbus A320 family (35)</b>			
 <b>Airbus A330 / A340 (21)</b>			
 <b>Boeing 777-300ER (8)</b>			



Introducing SWISS



Bombardier C Series



LPV approach (SBAS)





# Bombardier C Series Aircraft

Launching customer :



First delivery:

June 2016

Aircraft type	03.10.17	End 2018
 Bombardier C Series 100	8	10
 Bombardier C Series 300	4	20
Total	12	30

# Bombardier C Series Aircraft

## Rockwell Collins Pro Line Fusion Avionics



Flight Deck



HUD



# Content

Introducing SWISS



Bombardier C Series



LPV approach (SBAS)



# LPV (SBAS) - Operational Approval

Aircraft LPV certification

Part of Aircraft Type Certificate  
(Bombardier)

Flight procedures

Jointly developed  
(Bombardier & SWISS)

Flight crew training

Performed in-house  
(SWISS)

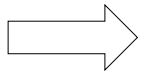
LPV (SBAS) is baseline on Bombardier C Series

# LPV (SBAS) – Flight Crew Training

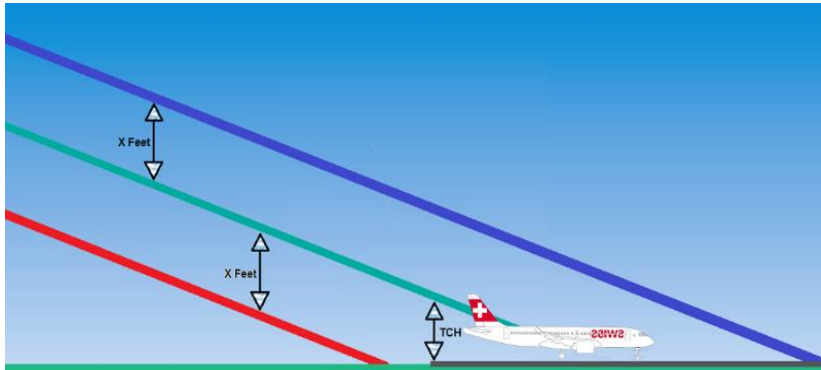


# LPV (SBAS) - Benefits

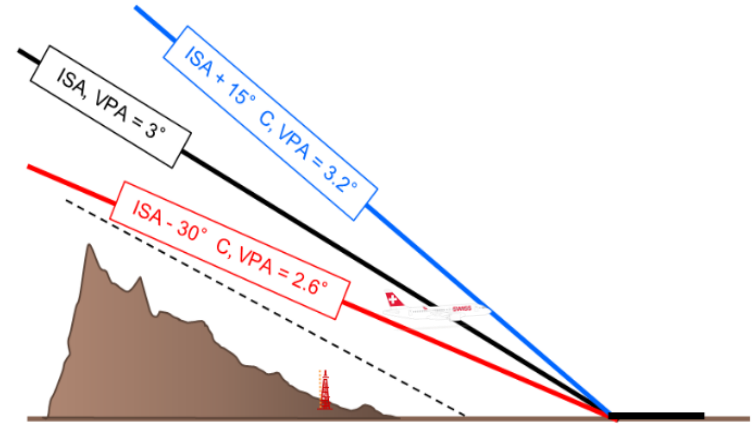
## Increased Flight Safety



Compared to Baro VNAV



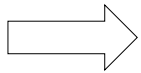
No influence of ambient **air pressure**



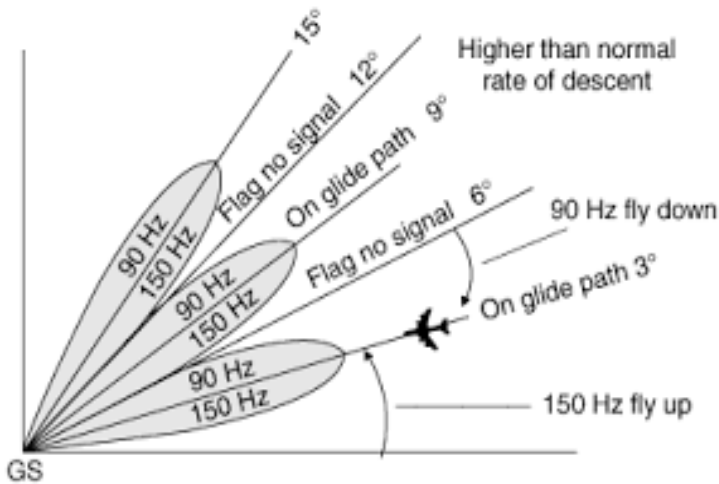
No influence of ambient **air temperature**

# LPV (SBAS) - Benefits

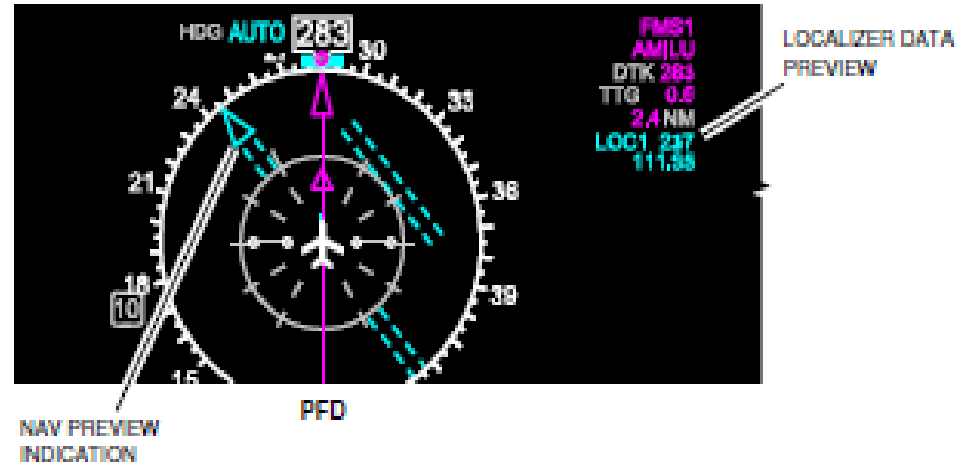
## Enhanced Flight Safety



Compared to ILS



No side lobe

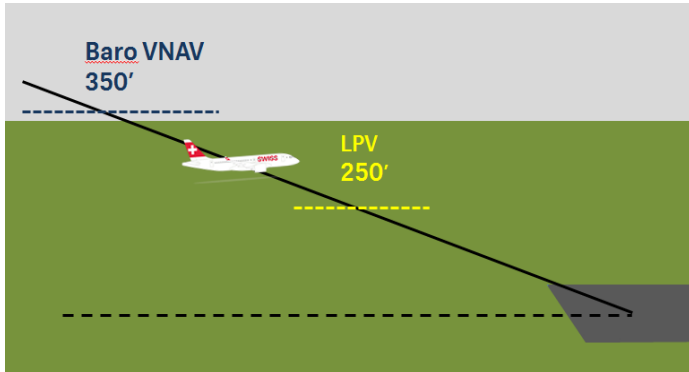


No navigation sensor change

# LPV (SBAS) - Benefits

## Increased resilience

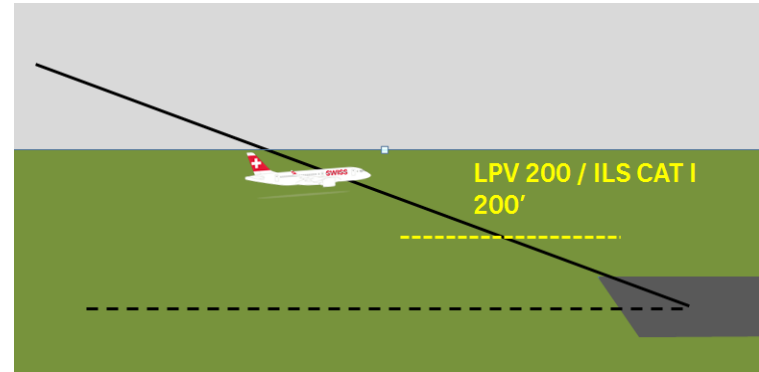
⇒ Compared to Baro VNAV



Lower approach minimum

## Enhanced redundancy

⇒ In case of ILS CAT I unserviceability



Additional CAT I approach LPV 200

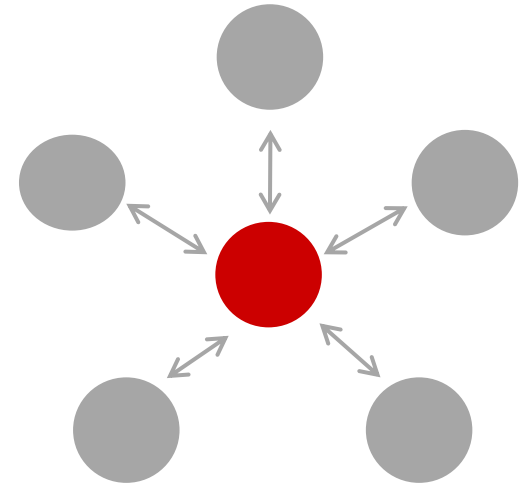
# LPV (SBAS) - Benefits

Less potential for human error

More robust hub operations

Better on-time performance

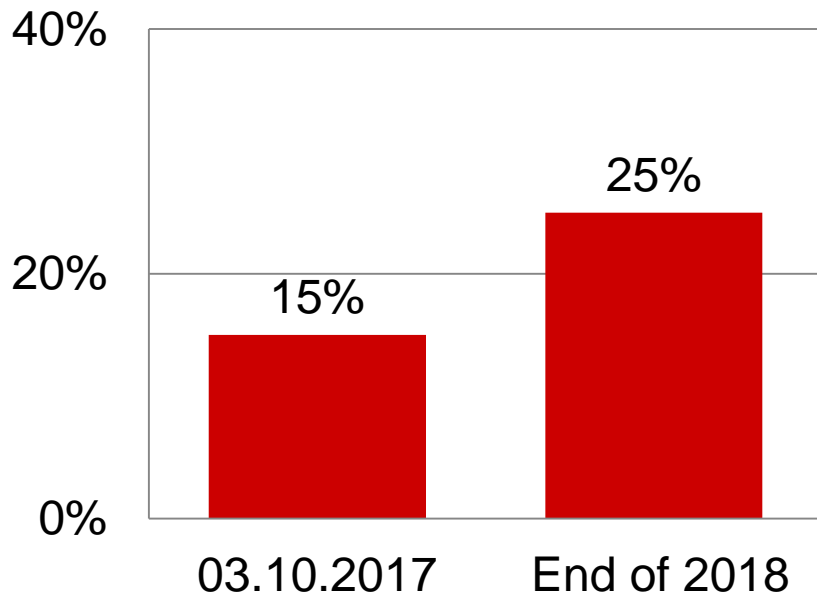
Less cancellations



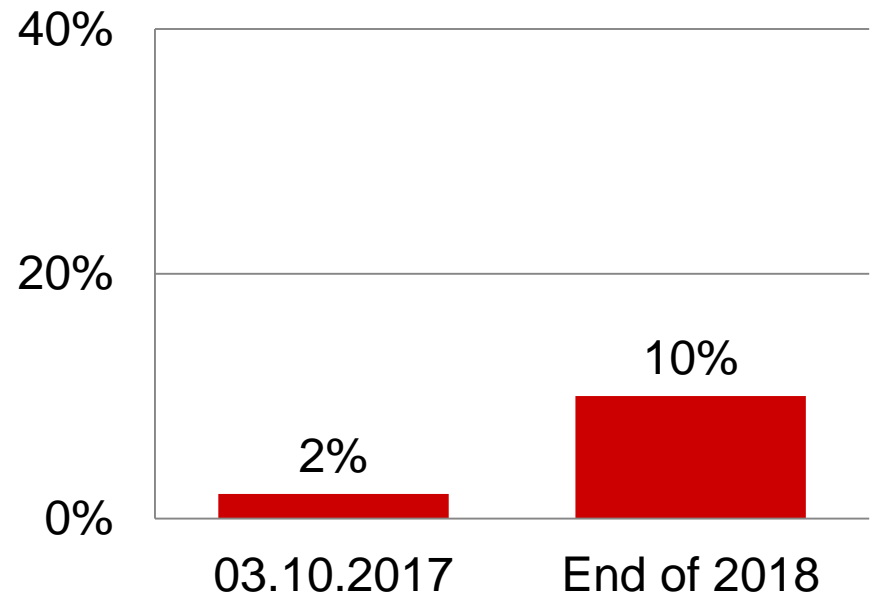
# LPV (SBAS) - Figures

## Actual and projected LPV approach operations

C Series fleet



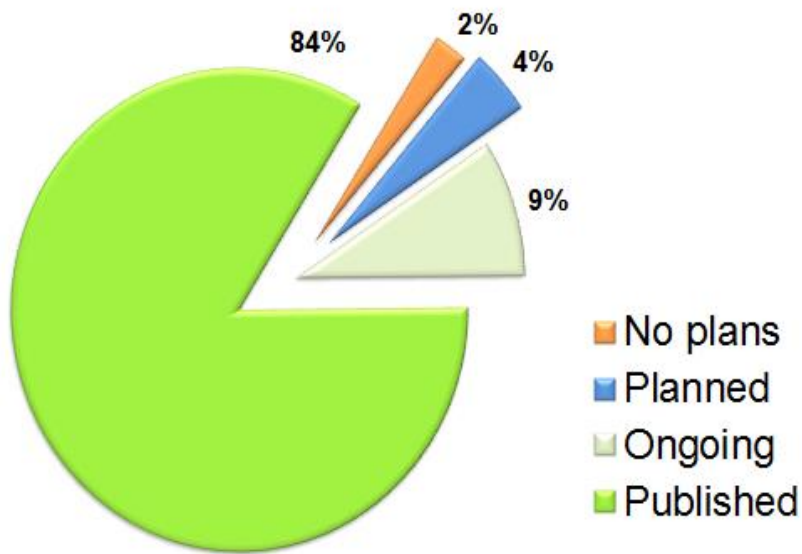
Total fleet



Estimates based on current and planned future operations.



# LPV (SBAS) – Implementation on C Series destinations



SBAS implementation status as % of flights



SWISS SBAS destinations

Thank you

