

# On the COVID-19 impact to broadband traffic in Japan

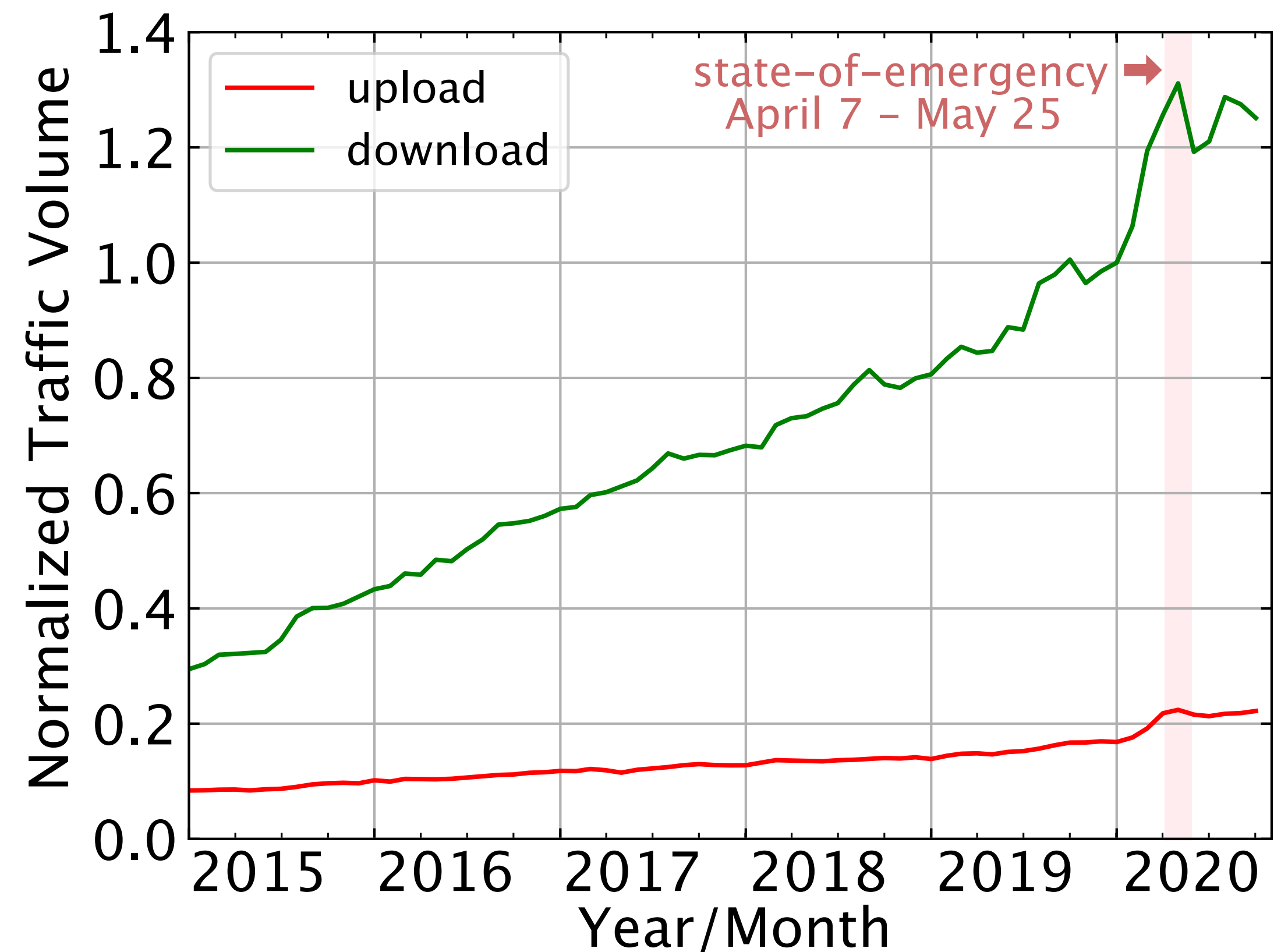
Kenjiro Cho, IIJ/WIDE

The COVID-19 Network Impacts Workshop, 2020



# IIJ's broadband traffic

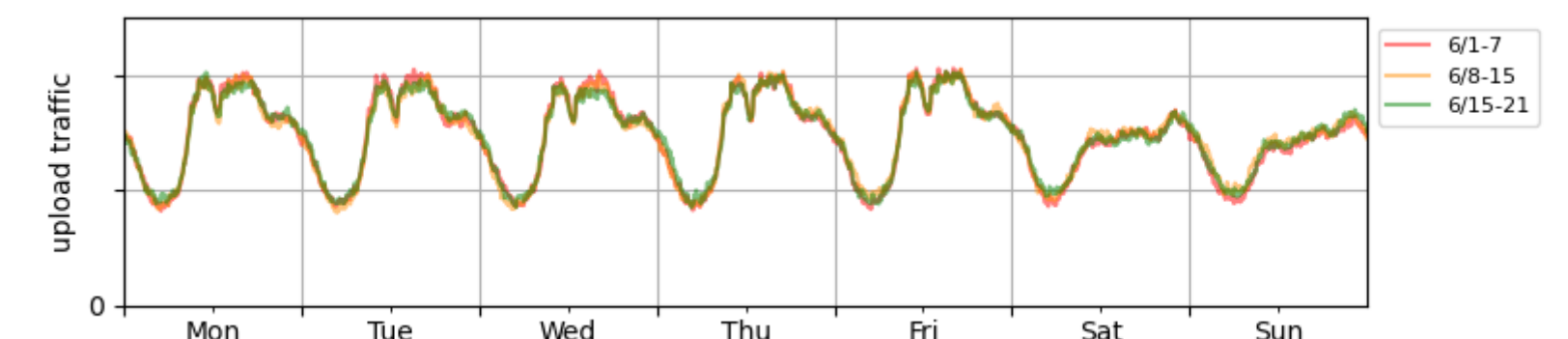
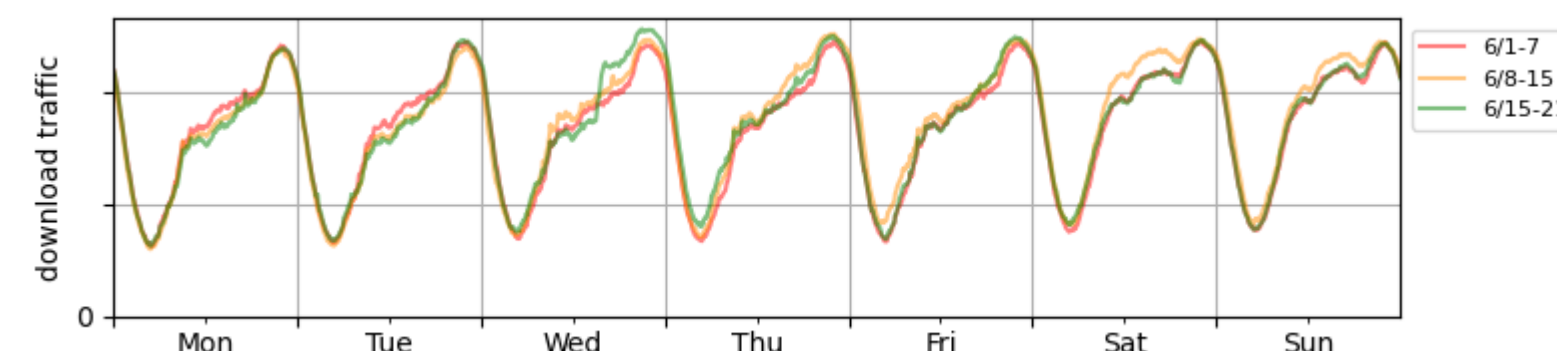
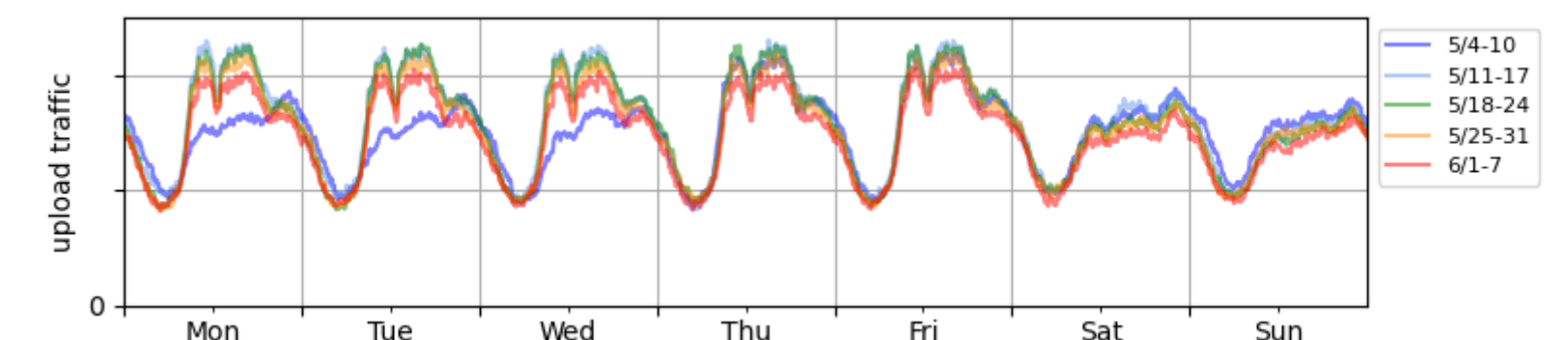
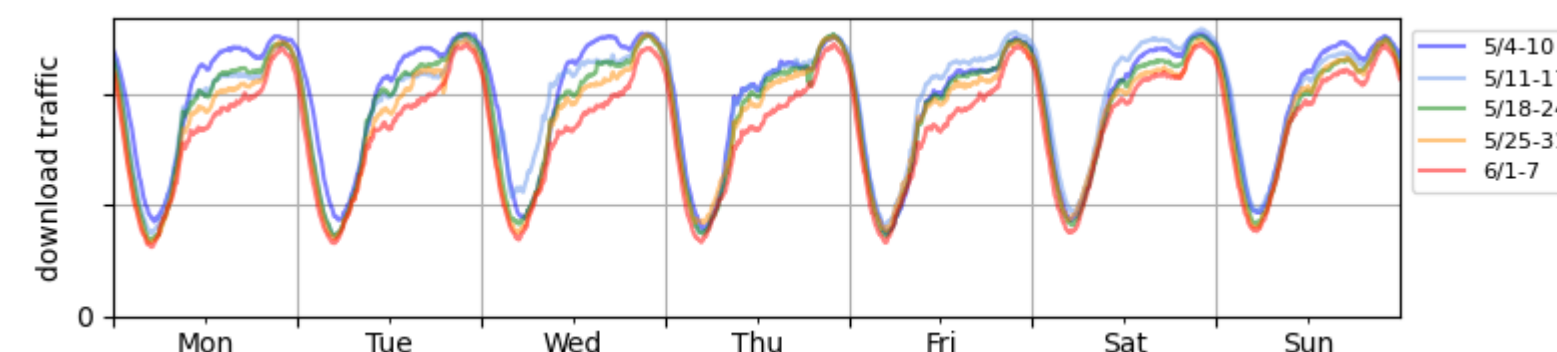
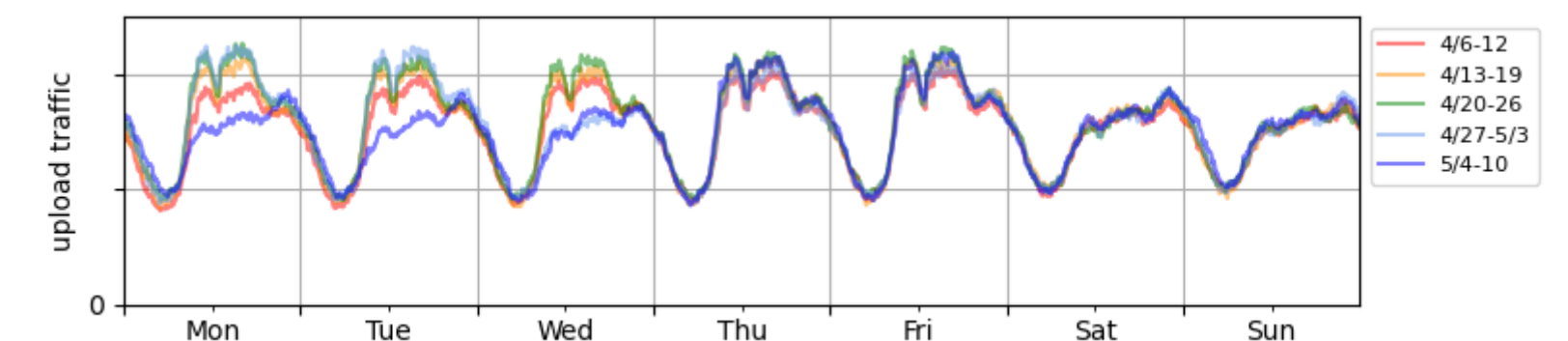
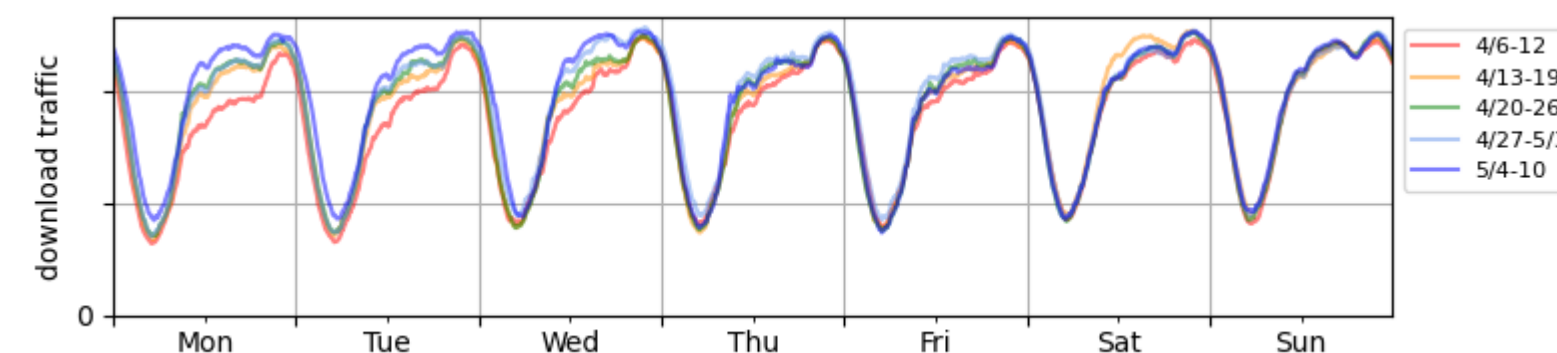
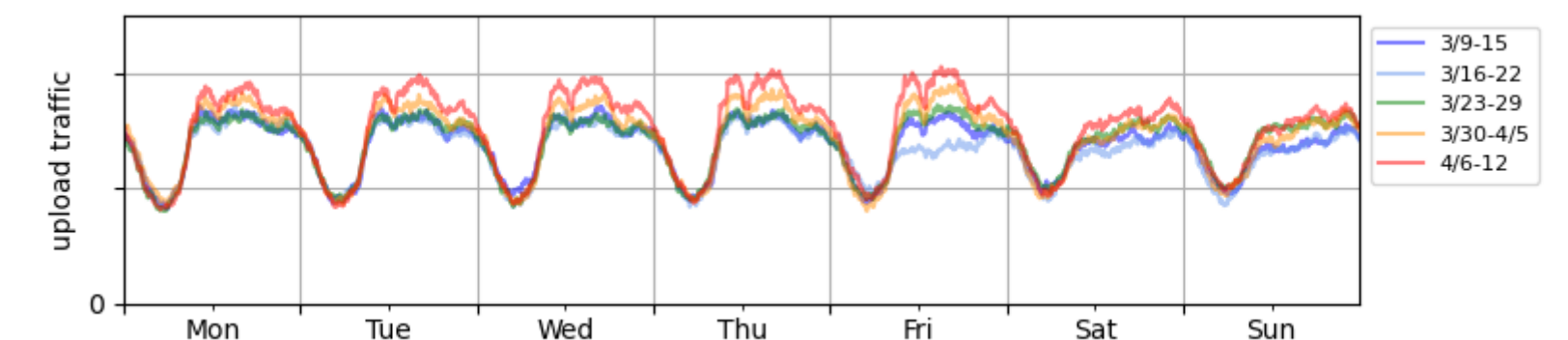
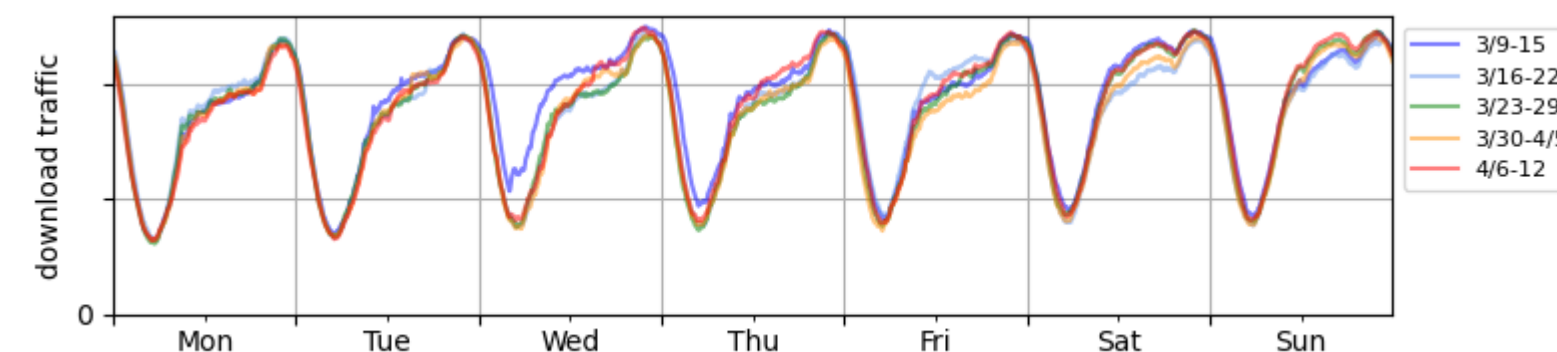
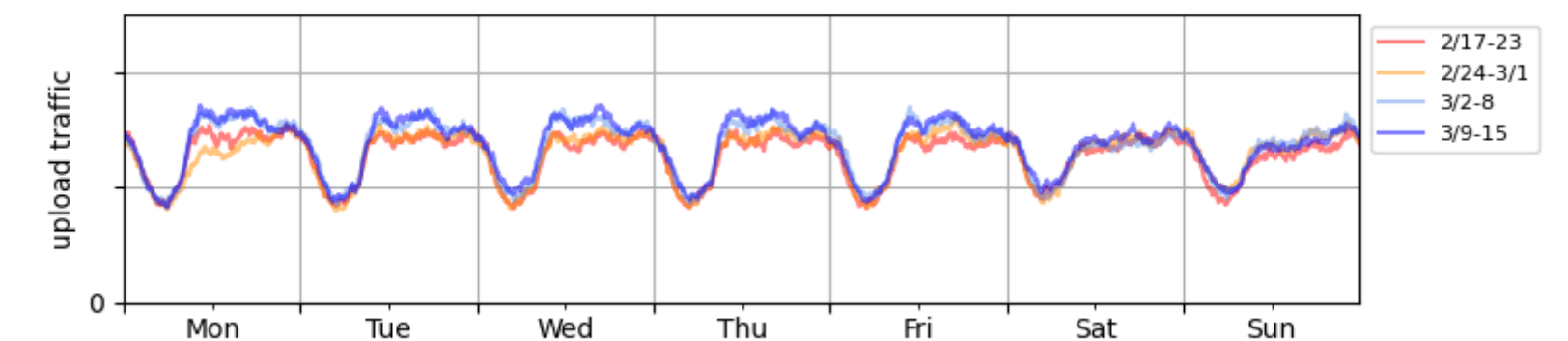
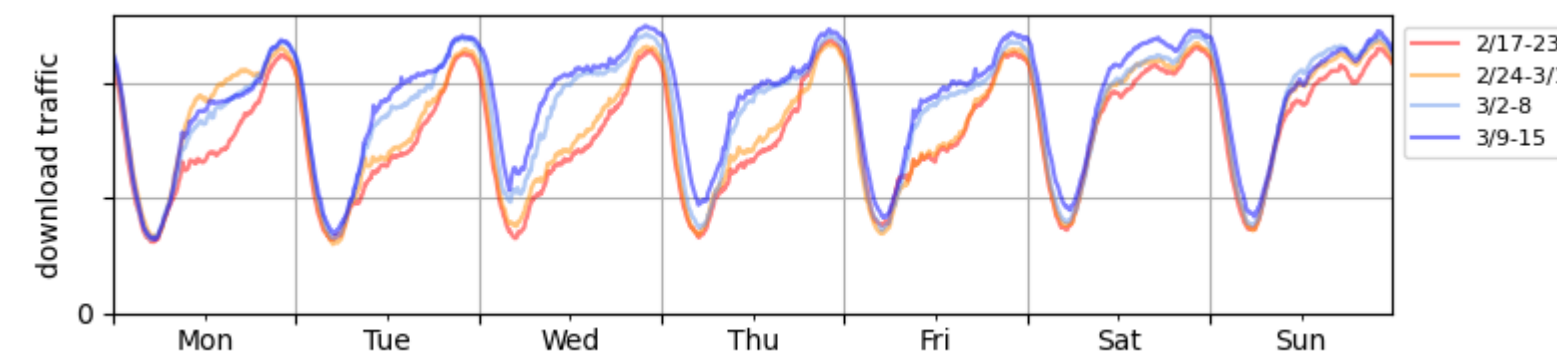
- COVID-19 in Japan
  - started in February
  - 1st wave in April
    - state-of-emergency: April-May
  - 2nd wave in July-August
    - now still on the lingering tail
- broadband traffic increased as COVID-19 spreads
  - work from home, video conferencing
- overall trends seems not far off from the original growth curve



IIJ's monthly broadband traffic (normalized to DL of Jan 2020)

# broadband traffic (Feb-Jun 2020)

- DL: increased from 3/3 when schools closed
- UL: daytime increased since April
  - remote work lagging (wasn't ready in March)
- clear drop for lunch/dinner
  - no video-conference
  - people eat at home with family?
- holidays similar to weekends
  - 2/24(Mon), 3/20(Fri), 4/29(Wed), 5/4(Mon), 5/5(Tue), 5/6(Wed)

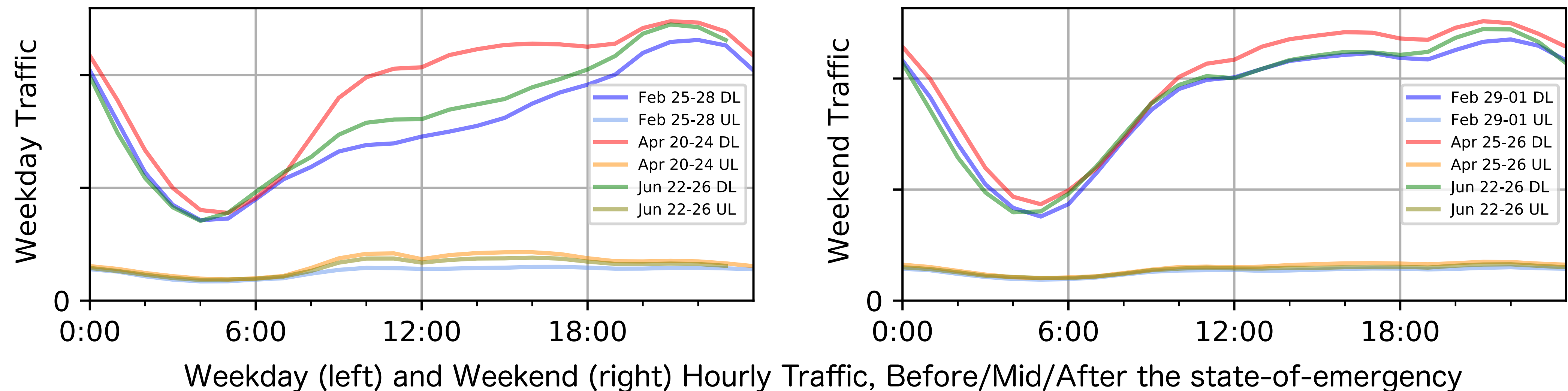


download

upload

# impact of COVID-19

- weekday traffic became similar to weekend under state-of-emergency
- then, traffic decreased as commuting resumed

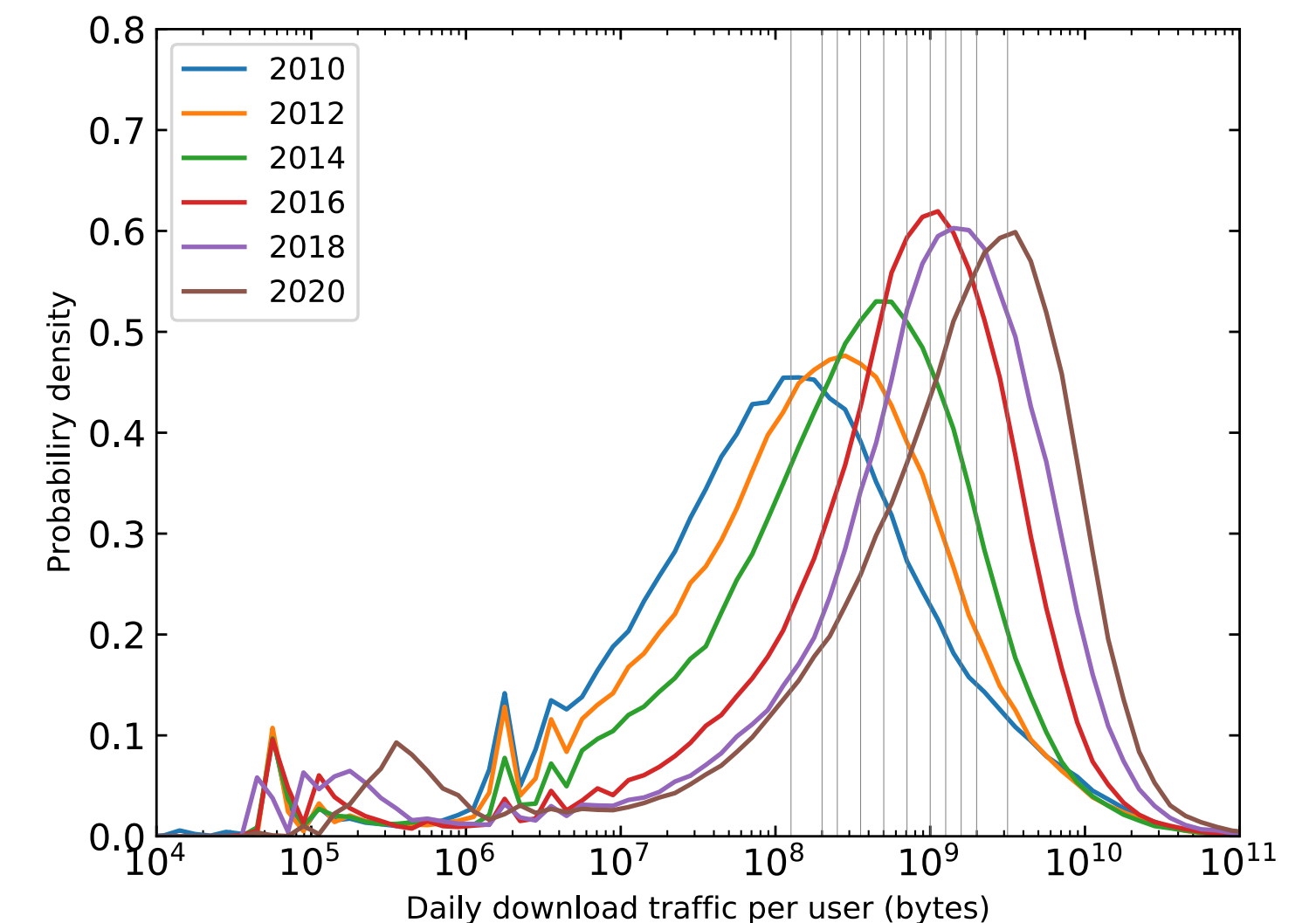
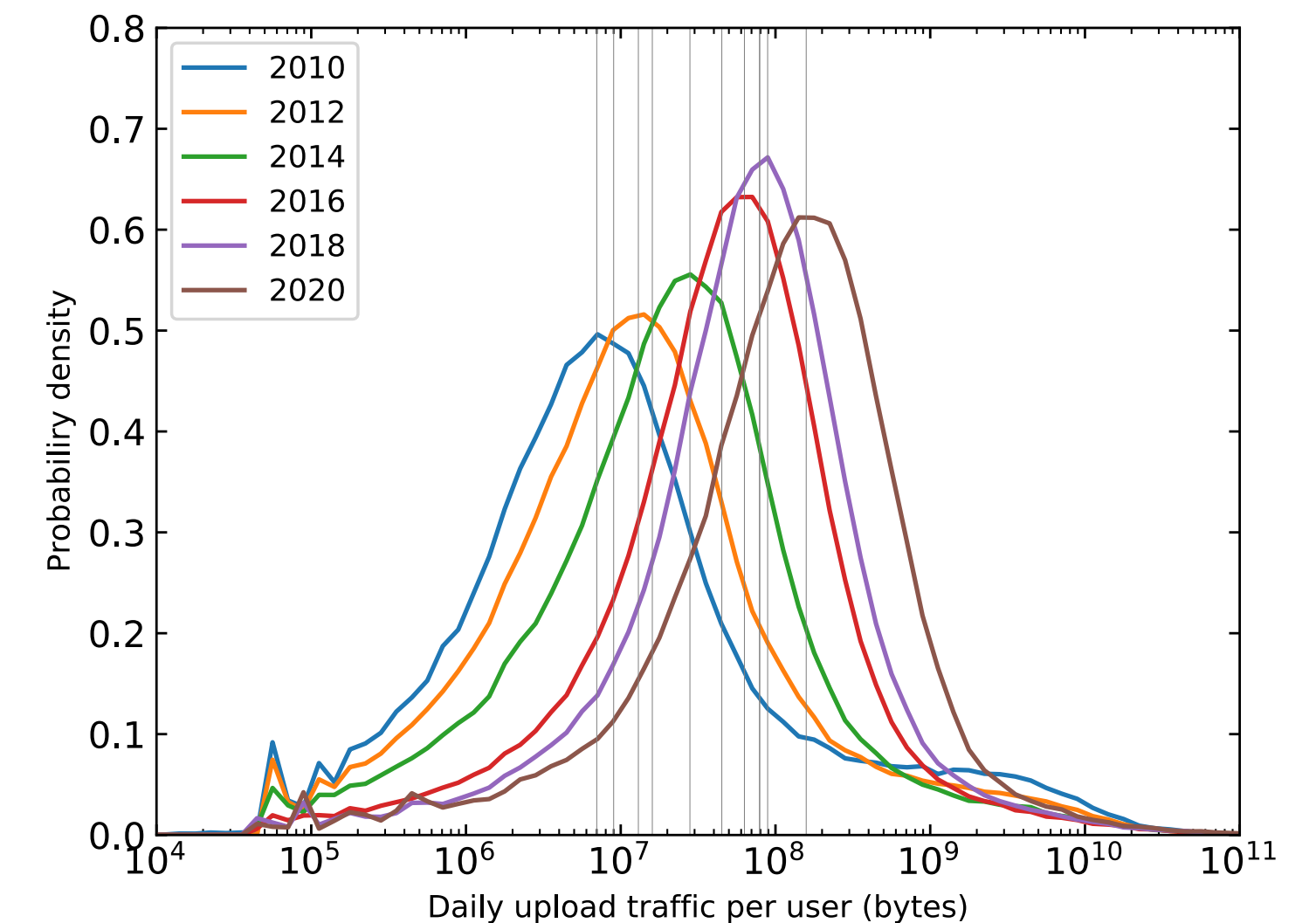




# daily traffic volume per user

- comparing 1-week data in June
  - larger growth during 2019-2020
  - still not so far off in semi-log scale

year	upload (MB/day)			download (MB/day)		
	mean	median	mode	mean	median	mode
2007	436	5	5	718	59	56
2008	490	6	6	807	75	79
2009	561	6	6	973	91	100
2010	442	7	7	878	111	126
2011	398	9	9	931	144	200
2012	364	11	13	945	176	251
2013	320	13	16	928	208	355
2014	348	21	28	1124	311	501
2015	351	32	45	1399	443	708
2016	361	48	63	1808	726	1000
2017	391	63	79	2285	900	1259
2018	428	66	79	2664	1083	1585
2019	479	75	89	2986	1187	1995
2020	609	122	158	3810	1638	3162



daily traffic volume per user (2010-2020)  
upload (top) and download (bottom)  
vertical lines: modes

# summary

- overall impact to macro-level broadband traffic
  - traffic increased during working hours, but still well under the capacity
  - slowly coming back to the original growth curve
- reported issues with legacy infrastructure and equipment
  - 20 years since broadband boom: PPPoE, VDSL in apartments, old WiFi
- some good luck
  - no real lockdown in Japan, still fairly successful so far
  - Olympic preparation: many infra-upgrades scheduled, push for remote work
- these data from IIJ: similar reports from other Japanese ISPs