



Luas 2050

Presentation to TII Board
Jan 28th 2025

By: **Anthony Duffy**
Head of Project Services

Background / History

Background History

PROJECT VS STRATEGIC APPROACH



VS



TII Aims

1. Identify and Secure a pipeline of work
2. Protection and Renewals and also new projects
3. Through an integrated vision / plan for future
4. Consensus within TII

Background History



NTA Request

1. Review GDA Strategy
2. See if LRT provisions make sense
3. How they would be implemented, phasing, timelines etc
4. Any particular considerations, trams, depots, growth etc
5. Anything left out, TII suggestions

Luas 2050

Luas 2050 Objectives

PRODUCE A LUAS VISION:

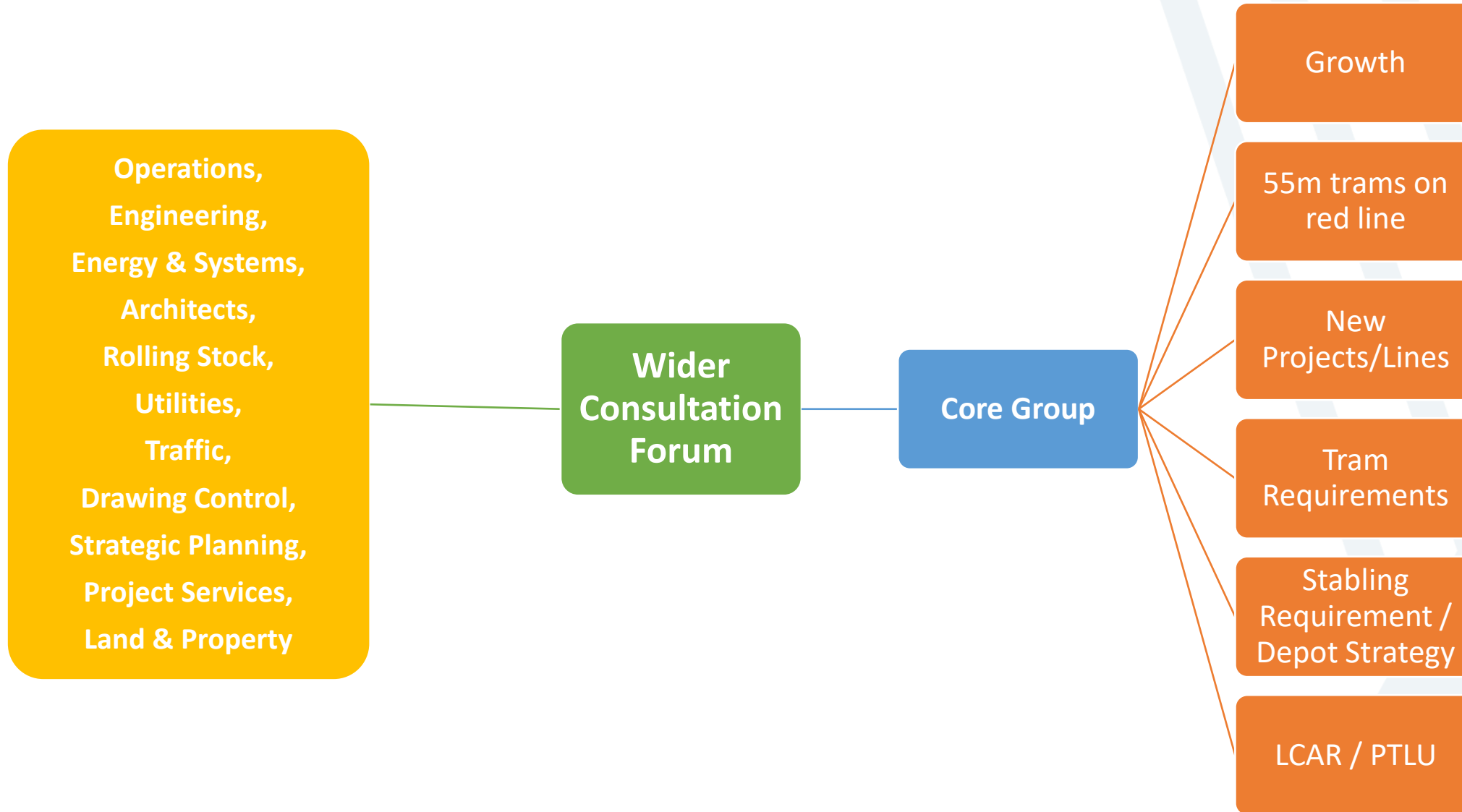
- TII RESPONSE TO GDA STRATEGY AND HOW WE SEE LUAS NETWORK EXPANDING OUT TO 2050 & ASSOCIATED WORKS
- ALIGN WITH TII CORPORATE STRATEGY
- TO BE COMPLETED END 2024



PROVIDE A RESOURCE / FORUM FOR THE ORGANISATION TO:

- MAINTAIN / UPDATE THE LUAS 2050 VISION GOING FORWARD
- ANSWER ANY QUESTIONS / CARRY OUT RELATED TASKS ASSIGNED
- RAISE ANY OTHER ISSUES FROM THE FORUM / GROUP

What is Luas 2050?



LUAS 2050 – METHODOLOGY – SCENARIO 1

STEADY STATE



- ONLY COMMITTED PROJECTS CONSIDERED
- EXTERNAL & INTERNAL
- GROWTH
- ASSET RENEWAL

GROWTH



- TRAM CAPACITY
- LUAS CENSUS
- FUTURE FORECAST
- 55M TRAMS – RED LINE

TRAMS



- GROWTH
- REPLACE EXISTING
- NEW PROCUREMENT
- MAINTENANCE OF EXISTING FLEET

DEPOTS / STABLING



- STABLING – HOW MUCH / WHERE / TYPE (SIZE OF TRAMS)
- DEPOT
 - CAPACITY – TYPE OF MAINTENANCE ETC
 - UPGRADES – RED COW – OFFICES AND DEPOT ITSELF

LCAR / PTLU



- TRACK / OHLE
- SUBSTATIONS
- STEEP – SYSTEMS RENEWAL
- DEPOTS
- OBSOLESCENCE

LUAS 2050 – METHODOLOGY – SCENARIO 2

NEW PROJECTS



- DETAILS
 - LENGTH
 - NR OF TRAMS
- PRIORITY
- WHEN
- HOW MUCH

GROWTH



- TRAM CAPACITY
- LUAS CENSUS
- FUTURE FORECAST
- 55M TRAMS – RED LINE

TRAMS



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LCAR / PTLU



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Output / Findings



LUAS 2050 – WORKSTREAMS - GROWTH

- Establish existing usage / demand and estimate future growth
- Utilised Census 2022 initially and then 2023
- Focussed on peak hour inbound initially
- Cross referenced with ERM data and TII internal calculations
- Difficult to Forecast growth due to recent issues, COVID, change to blended working, housing delivery
- Growth can be constrained by capacity i.e. Red Line
- Using a conservative long term growth rate, 2-3%
- Also cross reference with existing tram capacity

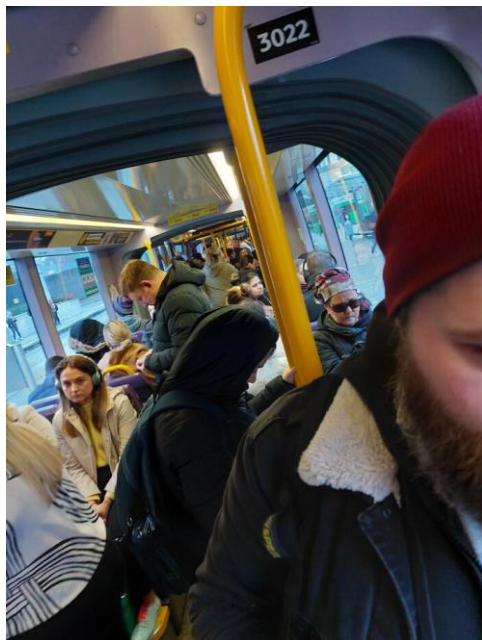


Growth – Tram Capacity

- Tram Capacity
 - Theoretical Tram Capacity
 - Census capacity
 - Comfortable crowding capacity

TRAM TYPE	401	402	502
Theoretical Total Capacity (5 people /m2)	305	312	408
Realistic capacity = x PHF of 85%	259	265	346
PHF of 80%	244	249	326
PHF of 90%	274	280	367
Census capacity figure	262	262	367
	86%	84%	90%
Comfortable crowding figure (60% of census figure)	157	157	220
Alternative comfortable crowding figure - using theoretical total capacity x 90% PHF x 60% comfort factor	165	168	220

Census 2023 – Heuston Station (Outbound)



Tram: 3022
Time: **08:09:04**
% Utilisation: **75%**
Volume/Capacity: 196/262



Tram: 3011
Time: **08:17:29**
% Utilisation: **77%**
Volume/Capacity: 202/262



- Tram: 3005 Time: **08:04:14** % Utilisation: **34%** Volume/Capacity: 90/262

Growth Analysis

		SMITHFIELD TO FORECOURTS																														
ppdph @ PHF =>		3,930	3,930	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716	4,716		
ppdph @ 60% PHF =>		2,358	2,358	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	2,830	
Peak Loading =>		2,501	3,251	3,479	3,548	3,619	3,692	3,766	3,803	3,841	3,880	3,919	3,958	3,997	4,037	4,078	4,118	4,160	4,201	4,243	4,286	4,329	4,372	4,416	4,460	4,504	4,549	4,595	4,641	4,687		
Loading % (60% PHF) =>		106%	138%	123%	125%	128%	130%	133%	134%	136%	137%	138%	140%	141%	143%	144%	146%	147%	148%	150%	151%	153%	155%	156%	158%	159%	161%	162%	164%	166%		
Overall Boardings =>		4,461	5,800	6,206	6,330	6,456	6,586	6,717	6,784	6,852	6,921	6,990	7,060	7,130	7,202	7,274	7,347	7,420	7,494	7,569	7,645	7,721	7,798	7,876	7,955	8,035	8,115	8,196	8,278	8,361		
Nr of trams per hr =>		15	15	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	
Max Loading =>		224	292	312	318	325	331	338	341	345	348	351	355	359	362	366	369	373	377	381	384	388	392	396	400	404	408	412	416	420		
% above 60% PHF =>		67%	80%	87%	87%	87%	87%	93%	93%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Growth rate =>		n/a	30%	39%	42%	45%	48%	51%	52%	54%	55%	57%	58%	60%	61%	63%	65%	66%	68%	70%	71%	73%	75%	77%	78%	80%	82%	84%	86%	87%		
Nr	Tram	Time	H/Way	Volume	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
1	3007	08:02:21	00:02:21	130	169	181	185	189	192	196	198	200	202	204	206	208	210	212	215	217	219	221	223	225	228	230	232	235	237	239	242	244
2	3005	08:10:49	00:08:28	216	281	301	307	313	319	326	329	332	336	339	342	346	349	353	356	360	363	367	371	374	378	382	386	390	393	397	401	405
3	4003	08:12:54	00:02:05	117	153	163	167	170	173	177	178	180	182	184	186	188	189	191	193	195	197	199	201	203	205	207	209	211	213	215	218	220
4	3015	08:14:41	00:01:47	188	245	262	267	273	278	284	286	289	292	295	298	301	304	307	310	313	316	319	323	326	329	332	336	339	342	346	349	353
5	4009	08:19:24	00:04:43	168	219	234	239	244	248	253	256	259	261	264	266	269	272	274	277	280	283	286	288	291	294	297	300	303	306	309	312	315
6	4011	08:23:59	00:04:35	198	258	276	281	287	293	299	302	305	308	311	314	317	320	323	326	330	333	336	340	343	347	350	354	357	361	364	368	372
7	3006	08:27:20	00:03:21	182	237	254	259	264	269	275	277	280	283	286	289	291	294	297	300	303	306	309	312	315	319	322	325	328	332	335	338	342
8	3026	08:32:09	00:04:49	161	210	224	229	233	238	243	245	248	250	253	255	258	260	263	266	268	271	274	276	279	282	285	288	290	293	296	299	302
9	3017	08:33:46	00:01:37	204	266	284	290	296	302	308	311	314	317	320	323	327	330	333	336	340	343	347	350	354	357	361	364	368	372	375	379	383
10	3008	08:37:52	00:04:06	204	266	284	290	296	302	308	311	314	317	320	323	327	330	333	336	340	343	347	350	354	357	361	364	368	372	375	379	383
11	3018	08:41:03	00:03:11	138	180	192	196	200	204	208	210	212	215	217	219	221	223	225	228	230	232	235	237	239	242	244	247	249	252	254	257	259
12	4005	08:48:34	00:07:31	224	292	312	318	325	331	338	341	345	348	351	355	358	362	366	369	373	377	381	384	388	392	396	400	404	408	412	416	420
13	4003	08:51:29	00:02:55	102	133	142	145	148	151	154	156	157	159	160	162	163	165	167	168	170	172	174	175	177	179	181	182	184	186	188	190	192
14	3002	08:56:09	00:04:40	164	214	229	233	238	243	247	250	252	255	257	260	263	265	268	271	273	276	279	282	284	287	290	293	296	299	302	305	308
15	3010	08:57:42	00:01:33	105	137	147	149	152	155	159	160	162	163	165	166	168	170	172	173	175	177	179	180	182	184	186	188	190	191	193	195	197

Average headway	00:03:51
Max headway	00:08:28
Min headway	00:01:33

Growth

CONCLUSION

- Green Line
 - Capacity ok for short term 2027 with current fleet
 - Turn back facility possibly required from 2027 onwards
 - Some changes / increases possible in service pattern
 - Most likely can be accommodated with existing fleet
- Red Line
 - At or over capacity
 - Not enough trams to increase service
 - Possible constraints on increasing service pattern
 - Potential constraint to accommodating future demand

55m Trams on Red Line?

- Red Line at or over capacity
- Limited scope for increased services
- Previous constraints may not exist any more or may be more of an appetite to address
- Infrastructure constraints not as much of an issue as previously
- Census 2023 analysis indicates that 55m trams may not be solution
 - Slow moving
 - Not suitable for particular characteristics of Red Line, lack of segregation, shared running, nr of busy junctions,
 - Possible safety issue with junctions etc
 - Need more trams, rather than longer trams

Stabling Requirements / Depot Strategy

- Follow on from previous workstreams
- Sandyford Depot
 - Depot is land constrained and cannot be increased
 - Stabling is full
 - Should we relocate or new depot?
- Broombridge
 - stabling to be increased as part of Luas Finglas
 - Not ideal for operational reasons
- Red Cow
 - Has some stabling capacity
 - Possible scope for land acquisition and further expansion
- New Project Requirements

Stabling Requirements / Depot Strategy

CONCLUSION

- Utilise a Super Depot Strategy / Approach
- Heavy maintenance to be carried out at Central Depot(s)
- Lighter maintenance / stabling at satellite depots
- Could be at Red Cow or alternate location
- Look at potential to secure additional lands at Red Cow
- Does not affect Red Cow Depot Upgrade Project
- Passive provision for approach in above Project
- Longer term issue (10-15+ years)

New Luas Projects

- Current NDP Projects
 - Luas Finglas, Luas Cork, Luas Lucan
 - Luas Bray and Luas Poolbeg likely to be pushed out in review
- NDP Projects Phase 2
 - Luas Bray and Luas Poolbeg
- Post 2042 Projects
- New Projects – TII Suggestions – Orbital routes
- Route length, nr of stops, possible service pattern, tram and depot requirements, likely service commencement

Figure 12.7: Post-2042 Light Rail Network



Potential Route Analysis

Additional TII Lines (post-2042)

Inner North Circle



Route Analysis / Tram Requirements

	Total length	off road	On street segregated	On street shared	Runtime	Comm Speed	Round time	Frequency	Trams	Spare trams	Tot Trams	Capacity	Tram/km
	(km)	(km)	(km)	(km)	(min)	(km/h)		(every x minutes)	(no.)	(no.)	(no.)	(pphpd)	
Green Line (*)	24.5				66.0	22.3	142.0	4	36	5	41		1.67
Red Line (**)	20				60.0	20.0	130.0	4	33	5	38		1.90
Luas Finglas	3.8	2.76	1.09	0	11.6	19.6	33.2	8	5	1	6		1.58
Luas Lucan	20	10.81	8.35	0.84	67.1	17.9	144.2	5	29	4	33		1.65
Luas Bray	6.4	6.05	0.15	0.16	18.3	21.0	46.5	5	10	2	12		1.88
Luas Poolbeg	2	0.62	1.03	0.38	8.4	14.3	21.8	5	5	1	6		3.00
Clongriffin	10.3	0.88	7.89	1.48	43.1	14.3	96.2	5	20	3	23		2.23
Tynrelstown	9	2.72	4.5	1.47	35.3	15.3	80.6	5	17	3	20		2.22
Blanchardstown	12.7	0	11.15	1.57	53.6	14.2	117.2	5	24	4	28		2.20
Clondalkin	4.6	1.71	1.83	1.04	19.3	14.3	48.7	5	10	2	12		2.61
Kimmage	9.2	3.5	3.71	2	38.5	14.4	86.9	5	18	3	21		2.28
Knocklyon	10.5	1.66	7.4	1.4	42.8	14.7	95.6	5	20	3	23		2.19
Sandyford	8.5	3.26	3.83	1.39	33.7	15.1	77.4	5	16	2	18		2.12
Inner South Circle	15.2	1.81	11.38	2.01	62.7	14.5	135.4	5	28	4	32		2.11
Inner North Circle	7.6	1.59	3.75	2.26	35.3	12.9	80.7	5	17	3	20		2.63
Luas Finglas Extension	3.1	1.46	1.64	0	10.1	18.4	30.3	5	7	1	8		2.58
Metro Orbital (West)	25	21.79	2.77	0.44	73.1	20.5	156.2	5	32	5	37		1.48

(*) average runtime and frequency between two terminuses

(**) average runtime and frequency between two terminuses

Tot Trams

378

LUAS 2050 – Projects

Delivery Timelines

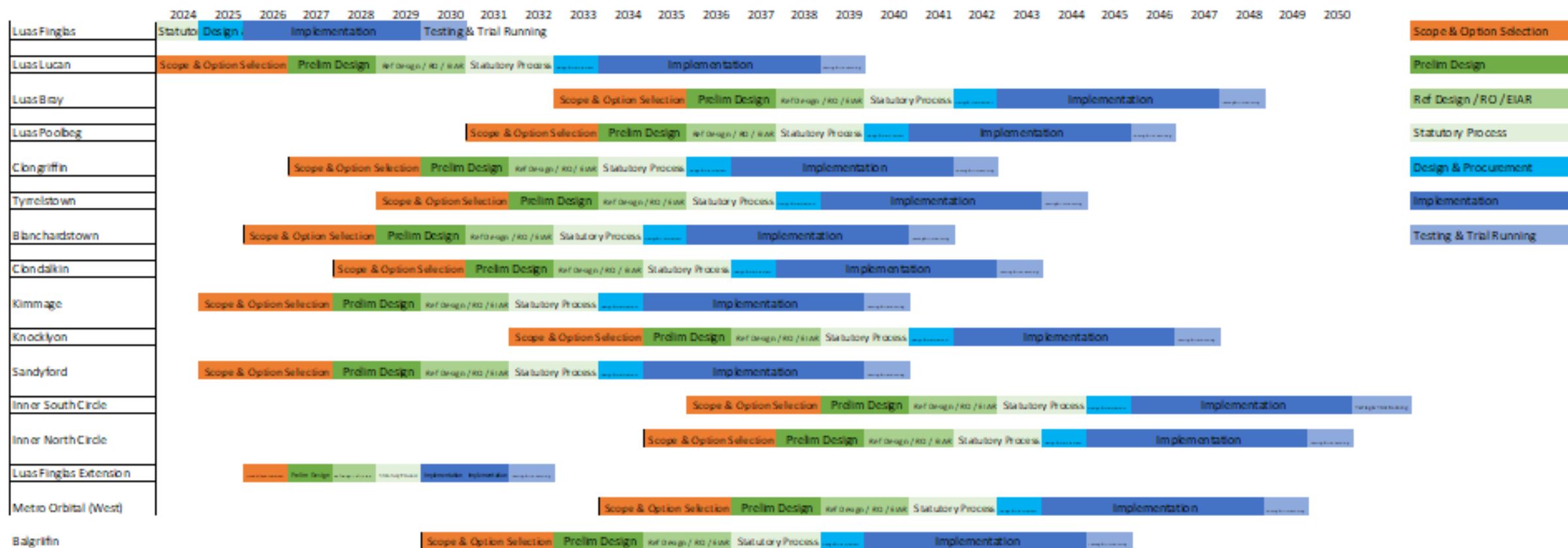
GENERIC TIMELINE

Phases		Min (Yrs)	Max (Yrs)	
1-2	SCOPE & CONCEPT & OPTION SELECTION	3	4	
3	PRELIM DESIGN	2	2.5	
3	R/O REF DESIGN / EIAR	2	2.5	
4	R/O PROCESS	1	2	
5A	DETAILED DESIGN & PROCUREMENT	0.5	1	
5B & 6	IMPLEMENTATION	5	7	
6	TESTING AND TRIAL RUNNING	0.5	1	
TOTAL PROJECT TIMELINE		14	20	

Figure 1 Phases of an NTA Project Life Cycle - Capital Investment



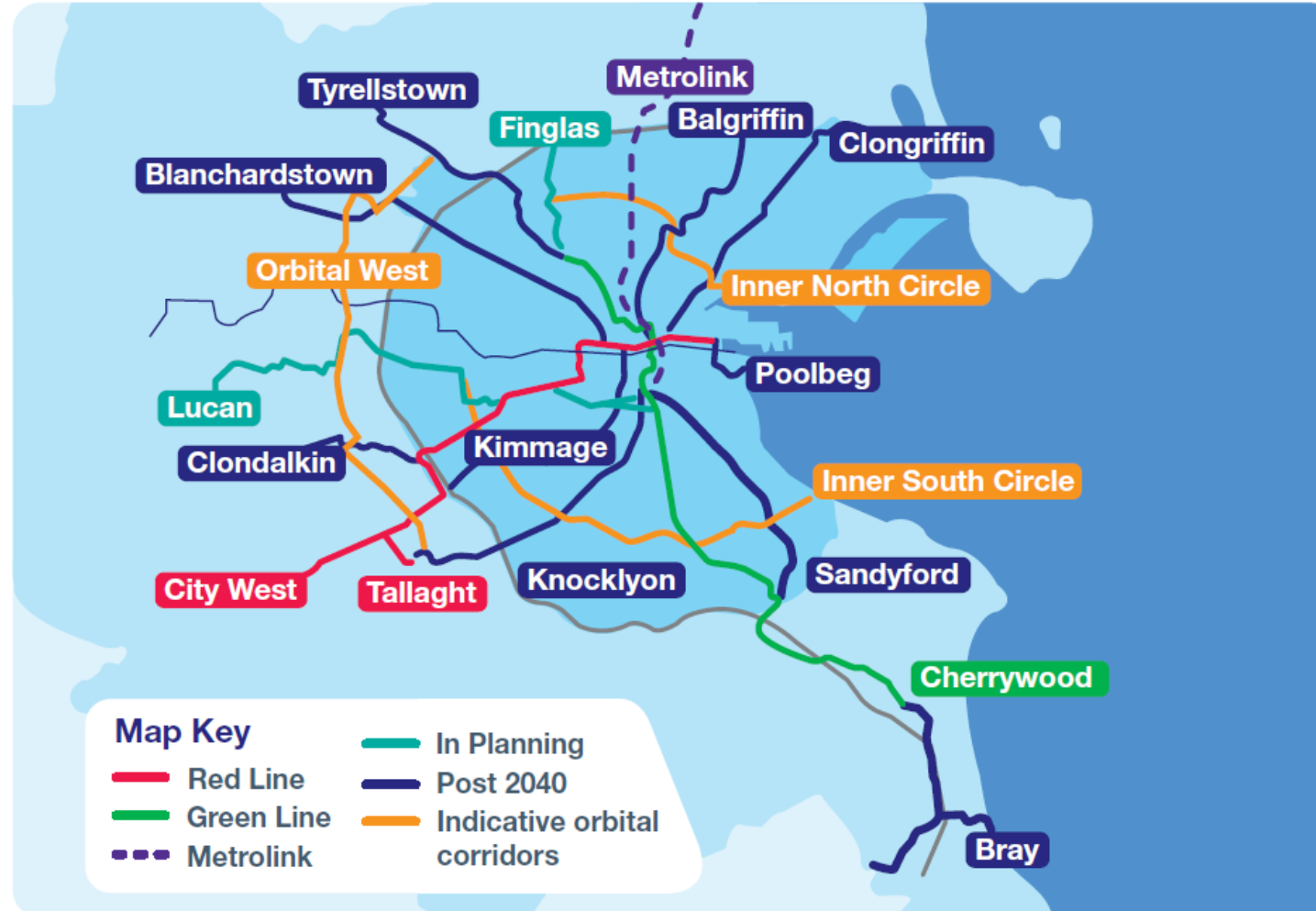
Potential Phasing



LCAR / PTLU

- Review for any likely projects / initiatives which might which influence / affect foregoing
 - STEEP – Systems Renewal
 - Red Cow Depot Upgrade
 - Track & OHLE Renewal Programs
 - Substation Upgrade Programme
 - Red Line Fleet Replacement
 - Green Line trams Mid life refresh

Luas 2050 vision



- ▶ TII is keen that the benefits of Luas are recognised, and inform Dublin and Ireland's future planning and transport policy decisions.
- ▶ TII welcomes the scale of ambition in current policies and plans, but would like to accelerate.
- ▶ TII will work with the NTA, local authorities, community, and political stakeholders to see this vision happen.

NTA Response

- Email outlining Works to be progressed in future
- Luas Poolbeg – Start late 2025
- Red Line Efficiency Study – Start now
- Green Line Operational Flexibility – Start now
- City Edge – Start now
- New Luas Project - Luas Sandyford – UCD? (TBC)
- Luas Bray – Start 2028 / 2030
- Requested initiatives / consultation to reduce project delivery timescales

NEXT STEPS

Next Steps

- Action NTA Instructions
 - Requires additional resourcing – Strengthening Initiative
- Document Progress to Date
 - Draft Booklet – Completed Dec 2024 - AECOM assisting
- Launch / Publicity??
 - Internal – TII & NTA briefings, internal Comms
 - External - Eolas magazine & Conference, Other?
- Scope out next phase
 - Depot Strategy
 - Red & Green Line operational capacity studies
 - Luas Poolbeg Pre-feasibility Study
 - GDA Strategy Projects Pre-feasibility Study
- Workshops on accelerating project delivery
 - Initial findings are that barriers / delays are outside the control / remit of the project team, i.e. NTA & Govt procedures, NTA requirements, planning, public etc
 - Investigate incremental project delivery – example Bordeaux & Manchester case studies
- Input to NDP Review as required



LOOKING FORWARD

- 2025 Positive funding position
- 2026 Status (potentially)
- Working on Five Luas Lines
 - Luas Finglas – In or Progressing to Construction
 - Luas Lucan – Route selection
 - Luas Cork – Route selection / Preliminary Design
 - Luas Poolbeg – Project Commencement
 - Luas TBC – Project Commencement
- Rolling Stock Contract Awarded and Order Placed for new Red Line Fleet
- Red Cow Bus Interchange – Construction Substantially Progressed
- Red Cow Depot Extension – Construction Commenced
- New Red Line Tramstop at City Edge (Naas Rd) – In or progressing to construction
- Asset Renewal and Luas Upgrade Programmes

FUTURE POTENTIAL MILESTONES

- 2027 Red Cow Bus Interchange Completed
- 2027 New City Edge Tramstop goes into operation
- 2028 Completion of Red Cow Depot Extension
- 2028 Commence delivery of new Red Line Trams
- 2028 Engineering Designer appointed for Luas Bray
- 2029 Onwards – commence work on new Luas line every 1-2 years to meet Luas 2050 targets
- 2030-2032 Passenger Service commences on Luas Finglas
- 2036+ Luas Lucan – passenger service commencement

QUESTIONS



Bonneagar Iompair Éireann
Transport Infrastructure Ireland



Bonneagar Iompair Éireann
Ionad Gnó Gheata na Páirce
Sráid Gheata na Páirce
Baile Átha Cliath 8
Éire, D08 DK10



Transport Infrastructure Ireland
Parkgate Business Centre
Parkgate Street
Dublin 8
Ireland, D08 DK10



www.tii.ie



info@tii.ie



+353 (0)1 646 3600



+353 (0)1 646 3601